

Planning and Designing for Pedestrians

Model Guidelines
for the
San Diego Region



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W-Trans

Prepared for



June 2002

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I. Executive Summary

[Y]ou don't meet other people while driving in a private car, nor often in a bus or trolley. It's on foot that you see people's faces and statures and that you meet and experience them. That is how public socializing and community enjoyment in daily life can most easily occur. And it's on foot that one can be most intimately involved with the urban environment; with stores, houses, the natural environment, and with people.

- Allan B. Jacobs "Great Streets"

The most memorable public places in our cities and towns are generally those places where people congregate on foot - the streets, parks, and squares. These are democratic places that make our towns and cities liveable and vital. Our streets especially have a significant responsibility to be accessible to all, and to be functional, safe, and attractive places to walk. However, despite its ubiquitous nature, walking itself is not something people think or talk about very often. Discussions of urban mobility are dominated by traffic reports, congestion relief, parking problems, etc., and throughout much of the United States pedestrians lack a unified policy treatment. However, the creation of the SANDAG Model Pedestrian Guidelines is an indication that concerns of pedestrian mobility, safety and accessibility are increasingly finding their way onto local agendas. Coupled with the region's favorable climate, these new policy initiatives have the potential of making the San Diego region one of the most walkable in the United States.

While traffic laws define the legal framework within which pedestrians are part of the transportation system; the national standards for transportation design (i.e.; the AASHTO "Green Book") tend to treat pedestrians as a secondary issue to traffic flow, and focus on safety rather than accessibility. Therefore a clear conventional wisdom around pedestrians' rights and best practices for the design of pedestrian systems (sidewalks, street crossings, etc.) has not yet fully emerged. But increasingly interest in pedestrian issues is being addressed through public policy and changes in the built environment. Planners, designers, officials and citizens are becoming more aggressive about improving the quality of community life, and pedestrian comfort and access are seen as a key component to this. Guidelines such as these and ones that deal with transit-oriented development and multi-modal street design standards are being required by an increasing number of agencies and municipalities. This is a positive step because it increases the awareness that public



Figure 1.1. An uncomfortable pedestrian environment



Figure 1.2. A pleasant, shaded and simple furnished sidewalk

Who are Pedestrians?

For lack of a more succinct term, "pedestrian" is used throughout these guidelines to include people who walk, sit, stand in public spaces, or use a wheelchair, be they children, teens, adults, elderly, people with disabilities, workers, residents, shoppers or people-watchers. Pedestrian-oriented design is accessible design for all people.



Figure 1.3. A significant barrier to pedestrian accessibility



Figure 1.4. A pedestrian bridge that effectively connects neighborhoods between canyons and over a freeway

rights-of-way are important public spaces shared by many users beyond just the driver.

These model guidelines are intended to assist local governments and other interested entities in the creation and redevelopment of pedestrian areas and corridors throughout the San Diego region. These pedestrian places will serve people who travel on foot or in wheelchairs including those that have little transportation choice, and encourage people to walk rather than drive a private vehicle.

1.1 Scope of Guidelines

Research has been conducted by the Federal Highways Administration (FHWA) that shows that distance and travel time are the main deterrents to higher levels of utilitarian walking. As well, a number of environmental factors such as safety, noise, and poorly maintained sidewalks, and an overall lack of a pedestrian-supportive built environments also dampen enthusiasm for walking. A coherent set of guidelines that will create an environment conducive to walking must therefore integrate a wide range of planning and design criteria. The SANDAG Model Pedestrian Guidelines recognize and address the breadth of these issues. The guidelines begin with the "big picture," namely land use and transportation planning that creates a context for a safe and efficient pedestrian environment. The guidelines then focus attention on the design of the entire street right-of-way balancing the needs of motorized traffic and bicyclists with those of the pedestrian. Finally the guidelines present recommendations for the detail design of the "pedestrian realm" identifying appropriate dimensions, amenities, lighting, etc. and the design of the buildings fronting the pedestrian path.

It is desirable for the pedestrian and street network to be integrated whenever feasible. Therefore it is necessary to understand the characteristics of the street or streets that form the context of our communities and neighborhoods. The model guidelines provide a brief review of the methodology and "vocabulary" for identifying predominant characteristics of our streets. Identifying the prevailing condition is necessary in choosing the planning and design strategies presented in the guidelines in order to create a pedestrian-friendly environment.

Community Structure and Transportation Planning

Community structure is the basis for a pedestrian-friendly environment. A community's transportation system needs to provide a full range of transportation choices in a balanced and integrated manner. But sidewalks and streets cannot create a complete pedestrian-friendly environment on their own. There must be a complementary relationship between the transportation system and the

land uses it serves. The third chapter of the model guidelines addresses this relationship and provides information about the application of pedestrian design concepts to larger-scaled areas, such as regions, subregions, entire cities, or subareas of cities for both new and infill development. Jurisdictions may also be interested in identifying specific locations in their community as having a focus on pedestrian accessibility especially in the Transit Focus Areas identified in the Regional Transit Vision. The purpose of designating these areas is to encourage an appropriate mixture of uses and activities within a walkable distance and with transportation improvements to support walking as a convenient and safe choice.

The model guidelines provide recommendations for achieving these goals. Mixing of uses either vertically (within a building) or horizontally (within a center, district, or corridor) adds to the vitality, walkability and safety of these areas throughout the day. Traffic management techniques, coordination with bicycle facilities and parking, and defining the appropriate access to a transit facilities are also discussed as they are necessary to ensure a circulation system that is comfortable for pedestrians.

The guidelines recognize that in many parts of the San Diego region, the existing circulation system is established and in some cases it is not conducive to pedestrian travel. Retrofitting options are presented to achieve pedestrian design principles. Changes can be made within public right-of-ways to begin “mending” a disconnected system. Measures include installing sidewalks in neighborhoods where they are lacking, improving street crossings, and installing traffic calming elements (i.e.; reduce the speed of turning movements, slowing speed while maintaining traffic flow, etc.). Design solutions such as these are explained in Chapter 3 and in the following chapter regarding site and detail design.

Site and Detail Design

The principal issue in the design of a pedestrian-supportive street is how to allocate its space: how much space is needed for pedestrians to create active public space while at the same time maintaining appropriate space for parking, bicycles, vehicular movement and deliveries. The Site and Detail Design Chapter begins with a discussion of the four significant considerations related to effective pedestrian design. These are: ADA Accessibility; New Development vs. Retrofit; Relation to Current Standards and Practices; and Relation to Transit. The topics of ADA Accessibility and Relation to Transit form the basic minimum guidelines for all arterials in the region, including those that currently do not serve a large number of pedestrians (because they may in the future). Consideration is also given to the context of the site and detail improvements, be it in an urban, suburban, or a rural area.

One of the most effective means for making a corridor more pedestrian-friendly is providing for safe street crossings. Studies by FHWA and TRB (Transportation Research Board) have indicated



Figures 1.5 and 1.6. Two pedestrians on a less-than-pleasant stroll to a coffeeshop through an auto-dominated environment

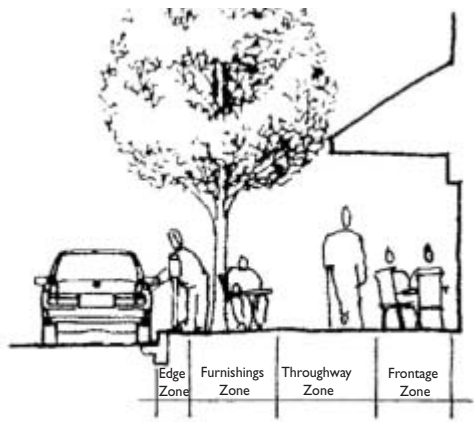


Figure 1.7. Pedestrian sidewalk zones



Figure 1.8. This relatively narrow sidewalk still has distinct pedestrian zones.

that simply marking crosswalks with minimal striping and signage at uncontrolled locations may be insufficient on high-volume, multi-lane streets. Furthermore, a singular standardize crossing design solution is not possible. The model guidelines offer a "menu" approach to crossing design requiring a mixing and matching of solutions depending upon the character and context of the street. A similar strategy exists in the guidelines for traffic-calming where improvements such as speed tables and raised intersections, pedestrian bulb-outs, pedestrian refuge median islands, traffic-calming circles, and textured surfaces are recommended to be developed through neighborhood consensus to ensure that one area does not benefit at the expense of another.

Beyond the many functional issues covered, the guidelines also describe how to design a pedestrian environment that improves the overall aesthetics of the community and can be appreciated at a human-scale, close-up and at slower speeds. This can be described as "placemaking" in the pedestrian realm. If properly implemented, improvements can make pedestrians feel they belong. This creates a "virtuous circle" (as opposed to a "vicious circle") where an environment that supports pedestrians, attracts more development and investment that in turn attracts more pedestrians, and so on. One only has to look at the more popular streets in the San Diego region to see this cycle in practice.

Key to establishing a successful pedestrian realm is determining the width of walking space which is more complex than it initially appears. Sidewalks are actually divided into imaginary lanes or "zones"- the "Edge Zone" immediately next to the roadway; the "Furnishing Zone" accommodating amenities such as street trees and transit facilities; the "Throughway Zone" that is the absolute minimum allowable for unobstructed movement (dictated by ADA); and the "Frontage Zone," the clear space between a building frontage and the throughway. The minimum recommended width in the guidelines is ten feet (with eight feet acceptable, but not recommended, in constrained situations). There is not a recommendation for a maximum width, but having too much space may be undesirable because the sidewalk may seem empty and uninviting similar to the condition present in many older pedestrian malls.

The pedestrian realm can also be considered the nexus of the disciplines of transportation engineering, landscape architecture, architecture and planning; the place where they all meet. An integral component therefore of a strong pedestrian realm is the adjacent site design and architecture. The guidelines advocate architectural designs that address and enliven the street - facades that are human-scaled and preferably "transparent" giving the pedestrian an understanding of activities taking place near them. Parking too has an immense impact on the comfort of pedestrians. It can be beneficial when it is on-street parking and acts as an effective buffer between the pedestrian and the moving traffic. It can also be detrimental if not planned and designed sensitively. Driveways are additional conflict points between the auto and

pedestrians and must be dealt with, and street-facing parking lots, if not screened properly can be unattractive, monotonous and a source of heat during the summer months. Providing pedestrian access across and within parking lots reduce the barrier effect that they can have within a neighborhood, as well as better serve those using the lots because once the driver steps out of the auto, they too become pedestrians.

Special attention is also given to the needs of children and seniors, and to non-roadway improvements such as trails, accessways, stairways that improve connectivity, making walking a viable mode. Finally, public art, specialized signage and attractive, well-located open space contribute to a "sense of place" and the pedestrian's enjoyment of public spaces.

It is the hope of those who have participated in developing these guidelines that those in the San Diego region who are responsible for the conditions of the pedestrian realm will use this document to further improve pedestrian access and safety. This along with other on-going efforts in the region can help to create a built environment that will complement the region's climatic and natural environment which are tremendously pedestrian friendly. In the future, the San Diego region should distinguish itself as one of the best places to be a pedestrian.



Figure 1.9. The safety of pedestrians at street crossings is of paramount importance.



Figure 1.10. Building recesses provide usable outdoor space despite the weather.

1.2 How the Pedestrian-Oriented Design Guidelines Can be Used

These model guidelines can be used for a variety of purposes. Local pedestrian coordinators, planners and traffic engineers from towns, cities and the county can work with SANDAG to customize and integrate the guidelines with local level pedestrian plans, land use and transportation policies, ordinances, regulations and street design guidelines. The guidelines can be integrated into local policies and practices incrementally, for example, starting with a planned street improvement near a public school, and then as the community and staff become more familiar with the guidelines, they can begin to integrate them into the broader policies of the city and everyday practices. Compliance with the guidelines could be a scoring criteria for establishing priorities for funding capital improvements projects. Local involvement for implementation is necessary in order to tailor the model guidelines to best serve local interests and specific conditions. For example, the specific needs and desires of National City will differ from those of Poway.

The model design guidelines could also be used by a developer or builder who is interested in developing a project that is pedestrian-friendly that could, in turn, expedite the development approval process. Alternatively, they could be used by a neighborhood to



Figure 1.11. “Uptown” project: example of mixed-use development; San Diego, CA



Figure 1.12. A lost opportunity for a pedestrian refuge island



Figure 1.13. A well-designed pedestrian refuge island

advocate for a pedestrian-oriented plan or development in their neighborhood.

Transit agencies will want to use the guidelines as a basis for planning access improvements to transit facilities and working with local jurisdictions to establish overlay districts around existing and proposed station areas.

These guidelines will also be useful for municipalities in the San Diego region pursuing improvements to roadways under Caltrans jurisdiction. In addition to having an official Bicycle/Pedestrian Coordinator in District 11, Caltrans created the Office of Community Planning (OCP) to address a statewide need for community-sensitive approaches to transportation decision-making. The OCP's goal is towards community-based “context sensitive design solutions” especially where State Highways serve as the Main Street for a community. Entering into negotiations with an adopted set of guidelines greatly assist in establishing the “context” into which improvements are intended.

The following section describes each chapter and further elaborates on who would find them most useful.

1.3 How to Use the Chapters and Who Should Use Them

Chapter 2: The Pedestrian Design Primer

The Pedestrian Design Primer explains in greater detail the concepts upon which the pedestrian design guidelines are based. The Primer asks essential questions about your project or area of interest, and helps you begin thinking about the existing regional, local, and site-level opportunities and constraints. This chapter is appropriate for elected officials, policy makers, citizens involved in community groups, and others who may not have a background in the concepts or vocabulary behind Pedestrian-oriented Design, but want to gain a quick understanding. It can also be used by professional designers, planners, and engineers as a reminder of the key issues and relationships between their different disciplines that will result in a stronger pedestrian environment.

Chapter 3: Community Structure and Transportation Planning

This chapter describes a methodology for understanding the structure of communities and the building blocks that can create a pedestrian-supportive community: districts, corridors, centers, and neighborhoods. The chapter also addresses the circulation system as a multi-modal network. It is appropriate for local policy makers and

planners establishing guidelines and standards to make their community more pedestrian-friendly through new development, revitalizing an existing neighborhood, or reinvesting in their transportation system.

Chapter 4: Site and Detail Design

This chapter discusses the pedestrian experience at the street-level, including amenities such as furnishings, street design, pedestrian circulation, landscaping, and the design of open spaces. It is appropriate for traffic and civil engineers and architects who apply site layout and circulation requirements for streets and specific building sites. Developers responsible for initial site selections, programming and project development, and agency staff in local jurisdictions who review such proposals to ensure pedestrian needs are being met are also the prospective audience for this chapter. Individual property owners wishing to improve conditions on their site, or concerned citizens wanting to improve their neighborhood will also find this chapter useful.

Appendices

The Appendices include a glossary of terms, a bibliography, and acknowledgment of contributors to the SANDAG Model Pedestrian Design Guidelines.

2. Pedestrian Primer

2.1 What is Pedestrian-Oriented Design?

Pedestrian-oriented design includes elements of sound planning and urban design that have been understood and used for many years. These elements combine with current development practices in a way that provides people with improved mobility, choice, and community identity. The major concepts are explained in Table 2.1.

Table 2.1 What is Pedestrian-Oriented Design?

Major Concepts	Why?
Link local land use and transportation decisions with comprehensive community plans and regional policies.	<ul style="list-style-type: none"> Improves quality of life and creates livable communities. Improves air quality, congestion and open space preservation opportunities.
Create walkable and human-scaled environments that encourage walking, bicycling, and transit use.	<ul style="list-style-type: none"> Most trips begin and end on foot. Even if major trips occur by car, short trips (1/4 to 1/2 mile) can be made on foot. Increased access to local services, entertainment and retailing; supports and encourages residential development and 24-hour activity. Better serves region's aging population. Improves pedestrian and bicycle safety. Discourages crime by increasing opportunities for pedestrian surveillance throughout the day. Supports improved physical health in the community.
Create compact mixed-use development patterns.	<ul style="list-style-type: none"> Increases intensity of development within walking distance of transit stops. Keeps people without a car from becoming isolated. Allows people to drive and park once for several errands.
Plan for viable land uses that are supported by local economics and the community.	<ul style="list-style-type: none"> A variety of needs and desires shape development patterns – pedestrian activity and transit access are two of many factors. Economically vital places are more interesting for pedestrians.
Provide adequate automobile access including a fine-grain and interconnected street system.	<ul style="list-style-type: none"> Allows for human-scaled streets. Facilitates local trips without requiring travel to and from arterials.

2.2 Pedestrian-Oriented Design as Link Between Land Use and Transportation Decisions

Land use and transportation must be addressed together to develop informed policies for the region. By deliberately planning land use and transportation together, efficiencies in both public and private investment can be achieved. The transportation system, a major public investment, will be used more effectively. Improved mobility and access lead to improved quality of life and a better business environment. Since all trips start and end on foot, the pedestrian realm is a critical linkage in the land use-transportation equation. Pedestrian-oriented design seeks to increase transportation choices and to decrease the number of trips that must be made by car. A "walkable environment" encourages people to organize their daily routine around this premise by creating an environment that is better suited for pedestrians.

The following table aligns some mutually supportive land use and transportation objectives.

Table 2.2 Linking Transportation and Land Use

Land Use	Transportation
Create pedestrian supportive environments	Good pedestrian environments can reduce the total number of trips taken, as well as support alternatives to single-occupant auto use.
Identify and promote areas for infill and redevelopment	Maximize utility of existing infrastructure and accessibility to existing development.
Promote compact development	Transit should serve major activity nodes that should be accessible to pedestrians and bicyclists.
Protect natural open spaces and parks, but allow them to be accessible	Plan rights-of-way carefully and allow for access to preserved open space and recreation areas by car, foot, bike and public transit.
Provide a mix of uses in appropriate locations	Allow for shared parking, internalization of trips, and a more even distribution of trips throughout the day.

2.3 Elements of a Walkable Environment

Table 2.3 Elements of a Walkable Environment

Element	Description
Sidewalk Design	In general a sidewalk should be wide enough to provide for four distinct zones: the <i>edge zone</i> that separates the roadway from the sidewalk; the <i>furnishing zone</i> providing space for street furnishing and landscape; the <i>throughway zone</i> that provides a minimum four foot width for ADA accessibility; and the <i>frontage zone</i> providing a "shy distance" between the throughway zone and building frontage/property line.
Access to Desired Uses	A successful pedestrian-oriented community or neighborhood should have a mix of complementary uses within convenient walking distance and connected with a comfortable pedestrian pathway network.
Access for Persons with Disabilities	Considerations must be made to ensure that persons with disabilities are provided with equal access to work, home, shops, and transit.
Ease of Crossing Street	Wide streets can be intimidating and more dangerous for pedestrians to cross. Methods for shortening crossing distances, providing a safer transition into the shared right-of-way, and building a stronger visual connection for pedestrians crossing the street must be employed.
Manageable Walking Distances	A typical comfortable walking distances from an origin to a destination is 1,200 feet to 2,000 feet or a 5 to 10 minute walking distance. Walking distances though are dictated by street patterns, and natural and man-made barriers. Provisions therefore should be made to provide passage through or across these barriers.
Scale	Pedestrian infrastructure such as signs, landscaping, paving, and building design detail should provide visual interest and be of human proportion.
Security	Pedestrian safety is greatly influenced by the amount, scale, intensity, and quality of lighting. Store fronts, office windows, and the windows of homes provide "eyes on the street."
Visual Interest and Community Identity	Good design should enhance the intimacy of the pedestrian environment, including open spaces such as plazas, courtyards, and squares, as well as the building facades that give shape to the space of the street.
Climate	Location and orientation of buildings, street trees, and architectural elements can make pedestrian areas more inviting by providing shade and protection from seasonal rains and winds.
Noise and Air Quality	Buffers between the roadway and sidewalks help to insulate the pedestrian from the harsher auto environment.
Efficient Parking	Sensitive planning and design of parking facilities can minimize the negative impacts of parking on the pedestrian realm while still providing good vehicular access to the community.

2.4 What Kind of Street Do You Have and What Kind Do You Want?

It is desirable for the pedestrian and street network to be integrated whenever feasible. Therefore it is necessary to understand the characteristics of the street or streets that form the context of your planning effort. The purpose of this section is to provide a methodology or "vocabulary" for how a user of these guidelines can begin to identify predominant street characteristics. Identifying the prevailing condition is necessary in choosing the design and planning strategies that can be taken to create a pedestrian-friendly environment.

In the following discussions, particular types of streets and street networks are described. The reader is asked to assess their particular condition based on the criteria given¹. Each type or combination of types (they are not meant to be exclusive but rather, overlapping) necessitates a customized design approach.

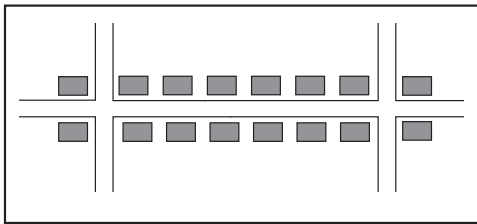


Figure 2.1. "Linear" development pattern

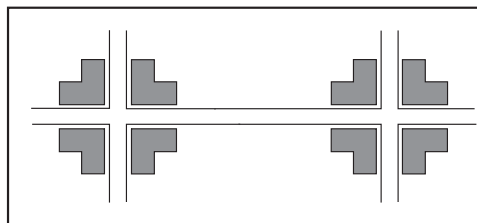


Figure 2.2. "Nodal" development pattern

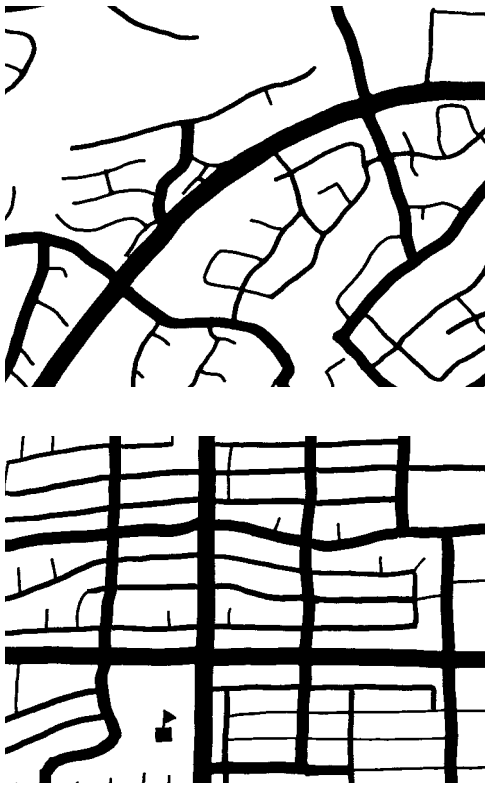
2.4.1 "Linear" and "Nodal" Structures

How a community is structured has a bearing on how its streets will be used. A community can develop around distinct centers ("nodes") such as a downtown or other commercial district, or development can be linear; a common pattern along an arterial street. Most streets have a structure that is predominantly linear or nodal; yet streets can share elements of both. For example, a primarily linear commercial strip is typically punctuated by major retail centers at arterial intersections that are more intensely used and "nodal" in character.

1. This technique was developed by Allan B. Jacobs and associates, Elizabeth Macdonald, Diana Marsh and Clark Wilson in the 1997 paper, "The Uses and Reuses of Over-capacity Urban Arterials," published by the University of California Berkeley's Institute of Urban and Regional Development.

Table 2.4 "Linear" vs. "Nodal" Structures

Street Type	Challenges	Opportunities
<p>A street with Linear Development is characterized by continuous, relatively uniform development, sometimes sporadic. Densities, uses, and scale of development vary gradually, and traffic flow is generally consistent along the length of the street.</p>	<ul style="list-style-type: none"> • Maintaining pedestrian interest and a supportive density of use is typically only possible on downtown linear streets. • Low land use intensities translate to great walking distances - distances over 1/4 mile are usually driven rather than walked. • Gaps or obstacles between uses may create unfriendly zones disrupting pedestrian interest. 	<ul style="list-style-type: none"> • Concentrate new development in already developed areas (i.e., transition to "nodal" pattern), leaving areas between for auto-oriented uses. • Vary the character and predominant use along the street so that a pedestrian supportive intensity of use can be maintained. • Reinforce the linear pattern by filling in gaps, emphasizing higher density to create a pedestrian-friendly transit spine.
<p>A Street with Nodal Development features more punctuated development, with concentrations typically on all sides of busy intersections or a short series of blocks.</p>	<ul style="list-style-type: none"> • At intersections, crossing facilities may be inadequate to ensure safety and convenience for pedestrians. • Existing nodes may be weakly developed, or single-use, often making them too isolated to be fully pedestrian-supportive. • May lack lighting, and other pedestrian amenities. 	<ul style="list-style-type: none"> • Improve crossing treatments; adjust signal timing to favor pedestrians; improve pedestrian visibility with bulb-outs; eliminate free right turns, etc. • Encourage complimentary uses. • Enhance strongly developed nodes with uniform street treatments and infill vacant properties or little-used parking areas.



Figures 2.3 and 2.4. The “isolated” and the “interconnected” street system

2.4.2 Interconnected or Isolated Streets

In determining how a particular street is functioning, one must look at the surrounding circulation context. Does the street in question work primarily as an “isolated” street or is it part of a network of streets that work as an interconnected and complementary system. Topographic constraints in many areas of the San Diego region preclude an interconnected street pattern. A common situation is for smaller streets to feed into a single major arterial (“dendritic” pattern). Therefore, at a neighborhood level these arterials are often isolated and auto-dominated.

Table 2.5 Interconnected vs. Isolated Streets

Street Type	Challenges	Opportunities
An “isolated” street primarily works alone in carrying the majority of traffic within an area due to the design of the circulation system, presence of nearby limited access freeways or topography.	<ul style="list-style-type: none"> • High levels of automobile traffic attract uses which require high levels of auto access making it more difficult to provide for pedestrians. • Large amounts of traffic and higher speeds require wider roadways for capacity and safety. 	<ul style="list-style-type: none"> • Strategies should focus on accommodating all forms of transportation comfortably and safely. • Identify opportunities for providing alternatives for traffic to use other routes (e.g., new street connections or linkages between parking lots).
Interconnected streets are characterized by a network of streets that serve different types of traffic while giving people a choice of routes to local destinations.	<ul style="list-style-type: none"> • Requires changes to many current local street design manuals. • Difficult to apply concepts in areas that are already developed with “dendritic” (branch-like) road systems. 	<ul style="list-style-type: none"> • Distributed traffic pattern allows limited right-of-way widths to serve multiple modes. • Provides shorter and safer routes for pedestrians.

2.4.3 Street Rhythm

Every street has a "daily cycle" of activity. Identifying the nature of the prevailing traffic rhythms is another factor in customizing pedestrian design guidelines to a particular street. There are four distinct traffic rhythms: constant flow, peak flows (i.e. rush hours), alternating peaks (a rush hour followed by heavy pedestrian activity), and pulses.

Table 2.6 Street Rhythm

Street Type	Challenges	Opportunities
Constant flow refers to a relatively even flow with peaks hardly noticeable due to either consistently low or heavy traffic volume.	<ul style="list-style-type: none"> • Low flow streets may have excess road capacity which can encourage higher speeds. • High flow street may become dividers in the community. 	<ul style="list-style-type: none"> • For low flow, reclaim some of the street for the pedestrians, bicyclists or transit. • For high flow provide buffers, improve crossings and/or reconfigure the roadway and circulation network.
Peak flows describe periods of heavy traffic followed by relatively lighter traffic; composition of the traffic may also change during the day.	<ul style="list-style-type: none"> • A heavy peak period may restrict possibilities for improvements to those periods between peaks (e.g.; on-street parking only during non-commute times). 	<ul style="list-style-type: none"> • Reduce peak load so that a more aggressive approach can be taken in terms of sidewalk, street design, and traffic calming.
Alternate peak flows occur when periods of lower traffic volumes are associated with heavy pedestrian activity.	<ul style="list-style-type: none"> • Usually indicates the street is playing a multi-functional role as being both an important traffic conduit and a community street. 	<ul style="list-style-type: none"> • Future development along the street should continue to foster pedestrian activity.
Pulses occur when signalization is synchronized to allow "platoons" of cars to maintain a constant speed.	<ul style="list-style-type: none"> • During the traffic "pulse" crossing the street may be difficult. 	<ul style="list-style-type: none"> • Provide opportunities for pedestrian activity in the "gaps" between pulses of traffic. • Reduce crossing distances and provide pedestrian refuge areas.

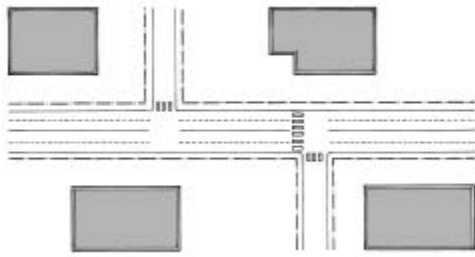


Figure 2.5. Typical conditions of a “Divider” street

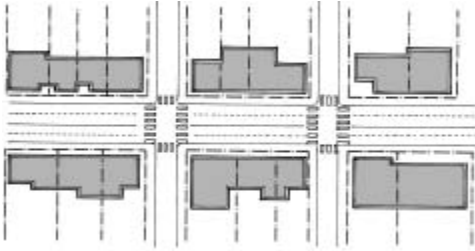


Figure 2.6. Typical conditions of a “Seam” street

2.4.4 "Seams" and "Dividers"

A street can be a seam which links the community across it, or a street can be a divider that splits a community in two or defines an edge or border to a neighborhood or district within a community. Identifying a street’s current and desired role as a seam or a divider will determine how to use the pedestrian design guidelines to their full advantage. To change a divider into a seam entails a great degree of effort and requires employing those design techniques typical of seams. However, this type of transition illustrates the primary goal of Pedestrian-oriented design and the application of the standards and guidelines.

Table 2.7 "Seam" vs. "Divider"

Street Type	Challenges	Opportunities
Seams are characterized by frequent opportunities to get to the street from the adjacent neighborhoods by either closely spaced cross streets or midblock pedestrian connections; uses fronting these streets are attractive to surrounding residents and workers.	<ul style="list-style-type: none"> When a street is a seam it serves dual functions, facilitating traffic and community activities. 	<ul style="list-style-type: none"> Generally a seam street is already "doing it right": crossing is easy, streets are generally not over 100 feet wide, buildings are oriented to the street, and uses and space along the street draw people there.
Dividers are essentially the opposite of “seams” and lack the ability to serve this dual function. Yet, dividers do not necessarily have entirely negative connotations; for example a well located divider can define the edge of a district.	<ul style="list-style-type: none"> If a divider is not serving an appropriate function, as an edge, transportation and land use patterns and functions will need to change in order to improve the pedestrian environment. 	<ul style="list-style-type: none"> Implement pedestrian standards and guidelines. In some cases, divider streets can be made “single-sided” by directing local and pedestrian traffic to only one side (with buffers) while reserving the opposite side for auto-oriented uses.

3. Community Structure and Transportation Planning

3.1 Introduction

Community structure is the basis for a pedestrian-friendly environment. A community's transportation system needs to provide for all modes of transportation in a balanced and integrated manner. But the transportation system cannot create a complete pedestrian-friendly environment on its own. There must be a relationship between the transportation system and the land uses it serves. A mix of complementary land uses, appropriate land use intensities, and compact development are necessary to make walking a viable option.

This section includes a discussion of the circulation system, how to think of it as a multi-modal network, and how the design of streets can address different transportation functions while maintaining an integrated pedestrian network.

This section also provides recommended guidelines in order to achieve pedestrian-oriented development at a large scale, such as regions, subregions, entire cities, or subareas of cities in order to produce a pedestrian-oriented community. It describes a methodology for thinking about the structure of communities. Community structure consists of land uses, natural features, and the circulation system. It is also made up of building blocks that can be developed at a pedestrian-scale: districts, corridors, centers, neighborhoods, edges, and seams. Land use type and development intensity are discussed in relation to creating pedestrian-oriented environments, and in relation to the support of different levels of transit service.

Additionally, public open space and parks are discussed as an important element of creating pedestrian environments, and a key aspect of creating a more sustainable built environment.

Purpose of this Section

Given that a community's transportation system must complement its land use patterns in order to create a pedestrian-supportive environment, this section of the guidelines includes guidelines related to community form. As appropriate, these consider whether you are creating a new community "from scratch" or rejuvenating an area through infill development and reuse. The basic spatial relationships between land uses and the circulation network that connect them are fundamental building blocks for pedestrian-oriented communities. Locating uses within walking distance of each other and providing a convenient walkable path are basic



Figure 3.1. Pedestrian-oriented development pattern; Rockridge neighborhood, Oakland, CA

requirements for creating pedestrian-oriented districts and neighborhoods.

If you are creating a new community, the applicability of this section's land use and transportation guidelines are obvious. If you are involved with infill development or revitalization of an existing community or neighborhood, reading this section will help you to understand the existing community structure and how you can take advantage of it or improve it as you design and implement your specific project.

If your focus is on making improvements to existing transportation systems without being able to reshape the built context, the transportation guidelines provide you with information that will allow you to improve the pedestrian environment. The goal is to allow pedestrians to have equal access throughout the entire San Diego region. Remember that at some point in every trip we take we are pedestrians.

3.2 Land Use Types and Organization

The structure of a community consists of land uses and circulation. Land uses are organized into various districts, centers, corridors, and neighborhoods. These are characterized by their predominant land use and the types of activities that occur there. The structure of a community can be described by a set of terms that relate to our cognitive understanding of the community. The elements of community structure often have a scale related to walking distance. This is a desired characteristic of pedestrian-oriented communities.

The basic elements of community structure include the following:

Neighborhood

Neighborhoods are the major building block of communities. They consist mainly of a definable collection of homes, parks, schools, and small clusters of commercial uses. Neighborhoods tend to be the element of community structure with which we most directly identify. Neighborhoods often have names, neighborhood groups, and geographic boundaries associated with them that people will recognize such as Hillcrest and North Park in San Diego, Los Arboles in Escondido, and Mar Vista in Imperial Beach. In older areas of cities and towns, neighborhoods are often defined at their edges by roads or districts of differing use, and they were often, but not always built by a variety of builders and individuals over a period of time. In the suburbs, neighborhoods tend to be defined by housing subdivisions or tracts that were built all at one time and consist of homes of very similar style, size, and value. Suburban neighborhoods tend to be more homogenous than older neighborhoods.

District

Districts are larger areas of the community that have a character defined by use (i.e., residential, mixed-use, employment, college or university, entertainment, etc.) and often by urban form (i.e., height and bulk of building, streetscape, etc.). A residential district consists of a group of neighborhoods that are defined by conditions at their edge (i.e., roads, changes in use, geographic or open space features, or jurisdictional boundaries). Examples include the Gaslamp in Downtown San Diego. Also, many smaller downtowns like Del Mar's mixed-use districts, or Rancho Bernardo and other medium-sized developments can be considered residential districts. The "Villages" of the City of San Diego's "City of Villages" plan is a similar idea to a city of districts.

Center

Centers are typically smaller areas of similar or related land uses, such as shopping centers, civic centers, or employment centers. Centers often have a strong relationship to the regional circulation network so that they are accessible to a broad cross section of the community. Centers often contain more active uses and will also define, or have an effect on, the character of the district or neighborhood around them. For example, a civic center will often have an employment or mixed-use center or district associated with it that will contain businesses that interact with the civic uses (lawyers, etc.) and services for the civic center's employees and visitors. These guidelines recommend a mix of uses within centers, while they still may have a predominant and defining use.

Corridor

Corridors are defined by linear elements in the community such as roads or other transportation corridors, and natural features such as rivers and arroyos. The concepts of roads as "seams" or "dividers" is discussed in the Pedestrian Primer section of the guidelines. Similar concepts apply to the land uses that are associated with roads and natural features. Seams are corridors that bring together the districts and neighborhoods around them. They are more pedestrian-friendly and can be crossed at frequent and convenient points. Dividers help to define edges and boundaries in the community. This can serve a positive function, but often dividers are streets and auto-dominated uses that divide a community where it does not want to be divided.

Edge

Edges define the transition point from urban development to a surrounding more rural, agricultural, or natural environment. Edges can be defined by natural features, hills or rivers for example, as well as by changes in land use. Changes in land use are typically determined by land use policy and may be arbitrary. Edges will be more stable if they are associated with the condition of the landscape, such as soil conditions that are conducive to higher quality agriculture or areas that support endangered species. Edges will also be more stable if they support the values of the community and support an improved quality of life.



Figure 3.2. Infill loft development; Berkeley, CA

3.3 Mix of Uses

3.3.1 Mixed-use Districts, Corridors, and Centers

Increasingly, cities and towns are focusing efforts on rejuvenating their downtowns. These efforts can build-off of the retailing trends, such as implementing concepts that create "main street" retail centers where people can stroll between shops, eat at a variety of restaurants, and visit cinemas.

Adding office and residential uses in the mix assures a certain level of around-the-clock activity. The form of these centers can be either in distinct centers, (i.e., Cedros Design District in Solana Beach) or linear in fashion forming corridors (i.e., Orange Avenue in Coronado). Regardless of their form a pedestrian-friendly community must provide attractive, safe, and walkable access to these areas. The intensity of land uses in a mixed-use area depends upon the area's social and economic context. A small town center of one-story buildings can be a mixed-use center while downtown San Diego can also be a mixed-use district.

Guidelines

1. Mixing of Uses should be achieved in any of three ways: **Vertical mixed use**, where uses are stacked on top of each other in the same building, typically ground floor retail with office and/or residential above. Ground-floor commercial, offers a high level of interaction with the pedestrian realm with restaurants, cafes, and small retail and service establishments. **Horizontal mixed-use** is where complementary uses are built side-by-side on adjacent parcels or within the same parcel. **Live-Work** units provide the opportunity for residents to use their homes as offices, workshops, studios, galleries, and other businesses. (Live-work should not be confused with "lofts" which is a term describing a particular building type that may or may not be live-work).

3.3.2 Civic Districts and Centers

By their nature, civic facilities and amenities such as community centers, schools, libraries, parks, and police and fire stations belong to the public and should be viewed as a key element in creating community structure. Sensitive planning is necessary to maximize the facility's visibility, accessibility, and utility. While these civic uses are typically integrated into mixed-use centers or residential neighborhoods, there are opportunities within a larger community or city to create a district or center that is predominantly civic in nature and use.

Guidelines

1. A Civic District or Center should contain the primary civic uses of a community, such as: city hall, the county courthouse, the main library, a civic auditorium or concert hall, or other key civic facilities. These buildings can be complemented by a civic open space serving as a public gathering place - the town square or plaza.
2. Civic districts should also include a mix of complementary private uses to add vitality to the district. Appropriate uses include: private office development, convenience retail, restaurants, and other service uses. Hotels and other residential uses may also be appropriate, particularly if the area has performance or museum uses. Retail and restaurants should be located to add activity to the district's streets and open spaces.



Figure 3.3. Oceanside Civic Center

3.3.3 Employment Districts, Corridors, and Centers

Large employment facilities are a reality for most communities. Typically their site planning and land use intensities do not support pedestrian activity, but instead focus on auto and truck access. Also, the spatial requirements of some employment uses do not complement smaller scale pedestrian environments. Still, these areas can be designed so that they are more benign and located at the edges or core of an area so that pedestrian (and bicycle) connections can be made with surrounding mixed-use districts or residential neighborhoods.

Guidelines

1. In addition to the employment uses themselves - whether they are office or industrial - restaurants or other services, that workers would need during the day should be located within employment areas or nearby in pedestrian-friendly mixed-use service areas.

3.3.4 Residential Districts and Neighborhoods

A goal of pedestrian-oriented design is to reduce peoples' reliance on the car. The design and location of appropriate residential neighborhoods can help achieve this goal. Providing residential neighborhoods within proximity to key destinations such as work, shopping, transit, schools, etc. is also vital in assuring that walking is a viable mode of transportation. Neighborhood-scaled retail or mixed-use centers can also serve as the center for a residential neighborhood in locations where the intensity of development, transportation access, and other conditions would support commercial activity, and can make for a safer pedestrian environment by providing "eyes on the street" throughout the day.

Guidelines

1. While the predominant use in residential districts and neighborhoods are homes, a variety of other uses should be included to complement the neighborhood and add to its vitality, walkability, and safety throughout the day. Such uses include: schools, community centers, day care, home businesses, small commercial uses within live/work development, professional and health care businesses in residentially-scaled buildings, and corner stores.



Figure 3.4. Otay Ranch School

3.3.5 Schools

Although schools can be thought of as civic uses, they are worthy of special mention. Schools often serve as the focal point for the community and provide open space, play fields, and gathering facilities for community events. As such, their location and their connection to the surrounding community should be given due consideration. Details of school site design and traffic control in existing school zones are discussed in the following chapter.

Guidelines

1. Wherever possible new schools should be sited with ease of access - pedestrian and vehicular - being a governing criteria. Their location should physically reflect their role as a community center and be within a mile of the students being served. Sidewalks, trails, and bike lanes need to connect to the school, and effective traffic control facilities need to be in place in the surrounding vicinity.

3.4 Achieving a Mix of Land Use Types

Achieving a new mixed-use development is an incremental process that may take years until build out. Depending on the state of the economy, housing may have stronger demand than employment and retail uses (or vice versa). Therefore, a threshold must be established that would result in the truly mixed-use development over time. This would require special regulatory language to establish thresholds for balanced land use in the community.

The following is an example of language used in The Santero Way Specific Plan (1999) for a mixed-use development in Sonoma County, California.

Ordinance language:

The mix of uses for development within the Retail Mixed-Use District should be within the range established in the following table. The first column lists the four potential land use types that are allowed in this District. The second and third columns list the floors on which the use is allowed. The fourth and fifth columns describe the percentage of building area that a use can occupy within a single development proposal. The result of this is a requirement of at least two uses per development proposal.

Refer to Table 3.1.



Figure 3.5. “Uptown” project: example of a mixed-use center; San Diego, CA

Table 3.1 Achieving a Mix of Uses - Santero Way Specific Plan Example

Land Use Type	Ground Floor	Upper Floor(s)	Minimum% of Building Area per Development	Maximum % of Building Area per Development
Retail	Parcels “A&B” – min. 4,000 sq.ft and Max. 9,000 sq.ft Parcel “C” – min. 5,000 sq.ft. and max. 11,000 sq.ft. (restaurant use: max. 4,000 sq.ft.)	Not allowed	0% 4,000 sq.ft. for Parcels “A” & “B” 5,000 sq.ft for Parcel “C”	50%
Office	Allowed	Allowed	0%	50%
Live/Work	Only work portion and kitchen allowed	Any portion or complete unit allowed	0%	50%
Residential	Only entrance lobby allowed	Apartments or condominiums allowed	0%	55%



Figure 3.6. Special areas within a town or city where the pedestrian is prioritized can create memorable civic life.

3.5 *Creating Pedestrian Supportive Areas - Special Land Use Considerations*

Pedestrians need access almost everywhere and appropriate facilities should be provided, but jurisdictions may be interested in identifying specific locations in their community where pedestrian access is prioritized. In this document these are referred to as “pedestrian supportive areas” and can be a variety of elements within the structure of the community: neighborhoods, districts, centers, corridors, or portions of these elements. The purpose of designating these areas is to encourage an appropriate mixture and density of activity, and complementary transportation improvements to support walking as an alternative mode of transportation. Particular regulations would need to be implemented through a tool such as an overlay district to achieve this by providing flexibility in typical transportation improvement standards and to create a compact pattern and complementary mix of land uses all within a comfortable walking distance.

The specific objectives of pedestrian supportive areas are to:

- ◆ Encourage people to walk, ride a bicycle, or use transit;
- ◆ Allow for a mix of uses to create an environment that engages people at the pedestrian scale;
- ◆ Achieve a compact pattern of uses within the area that is more conducive to walking and bicycling;
- ◆ Provide a high level of amenities that create a comfortable environment for pedestrians;
- ◆ Maintain an adequate level of parking and access for automobiles and service vehicles, but minimize curb cuts and parking lots along the primary corridor;
- ◆ Create fine-grained detail in architectural and urban form that provides interest and complexity at the level of the pedestrian; and,
- ◆ Provide sufficient density of employees, residents, and recreational users to support non-vehicular modes of travel.

It cannot be emphasized enough that jurisdictions should carefully consider how they create pedestrian supportive areas in the context of their specific circumstances. The usual precautions should be followed to assure that any specific ordinances, and other regulatory and policy documents, are in accord with each other whether it means adjusting the ordinance or revising other documents. This includes engaging the public and seeking legal counsel as part of the process.

The following is a discussion of points that jurisdictions should take into consideration when developing their strategy for creating pedestrian- supportive areas. The discussion points outline the intent of the particular regulations and provide examples from other jurisdictions that have developed and are implementing pedestrian- and transit- oriented developments. In order to gain a better understanding or "feel" for what constitutes a successful pedestrian supportive area, the reader should also refer Chapter 4: Site and Detail Design and its accompanying images.

3.5.1 Allowable Uses

Guidelines

1. Prohibit uses that, by their nature, are not pedestrian- or transit-oriented (Each jurisdiction will need to determine the amount of specificity and the types of uses they wish to prohibit in a pedestrian district). Existing prohibited uses should be allowed to remain, but be encouraged to relocate.

Exterior Display and Use

2. Outdoor seating for restaurants, cafes, and other eating establishments and pedestrian-oriented accessory uses, such as flower, food, or drink stands, provide pedestrian-oriented activities that encourage an active street-life and should be encouraged.
3. Care should be taken that enough room is left for persons walking, chatting, or standing on the sidewalk. This typically means keeping an eight foot clear circulation space along the sidewalk, although the minimum requirement for ADA is 5 feet (including passing zones).

Grocery Stores

4. It is suggested that grocery stores be limited to a maximum of 50,000 square feet as anything beyond this, in combination with the resulting size of parking lots and distances between public entries to the buildings, would extend walking distances to an uncomfortable length.

Uses Requiring Large Building Footprints

5. The major concern is that buildings should not be sited so they interrupt the desired pedestrian flow from the surrounding area to the mixed-use center of the pedestrian-supportive area.
6. A suggested maximum of 30,000 square feet should be set for building footprints, with neighborhood-serving grocery store previously described being an exception, because large building footprints are typically selling large-scale goods or large quantities of goods requiring the use of an automobile



Figures 3.7 and 3.8. A grocery store that complements the pedestrian realm; Pacific Beach, CA

to carry merchandise home. As a result, floor area to parking ratios will demand larger parking lots as floor area expands. Like industrial buildings, these buildings typically turn a blank facade to the street.

7. Large retailers should be required to build two-story stores to fit into more urban and pedestrian-oriented settings.
8. Stores should be required to have display and large, transparent windows along the street facade for pedestrians to view indoor activity, and have more active uses along the street such as cafes.

Drive Through Facilities

9. Establishments with drive-in or drive-through windows such as fast-food restaurants, drugstores, and banks should go through a stringent conditional use review to make certain that the drive-through facilities do not degrade the pedestrian-oriented environment.

Gas Stations

10. Gas stations are a necessary component within a community, but are generally not conducive to creating a pedestrian-oriented environment. Therefore, the number and location of gas stations within a pedestrian district should be controlled.
11. Gas station operators should look to historic examples of gas station design when the architecture was more refined and often had a relationship to its surroundings.
12. Gas stations often have excessive curb cuts for convenience to the auto. Therefore, a maximum allowable proportion of curb cut frontage should be established.

Light Industrial Uses

13. Most industrial uses are not conducive to creating a pedestrian-oriented environment and should be permitted only if they create an attractive street frontage and do not create noxious fumes and excessive noise.
14. Permitted industrial projects should include supportive commercial uses oriented to the street such as restaurants, coffee shops, and uses that support other daily needs of employees and allow them walking opportunities throughout the day.

Parking Facilities

15. Parking facilities are necessary in today's society, and should be designed in such a way to integrate with the neighborhood.

16. Jurisdictions should explore creatively inserting parking facilities into these finer-scaled landscapes through shared-parking agreements, careful site planning, lower parking requirements, innovative mixed-use configurations, and creative architectural and landscape design.

Outdoor Recreational Uses

17. Public space should not be an afterthought, particularly in situations where it plays such a central role. Ideally, uses will surround it and focus their front doors onto it to provide an active street life around its perimeter, creating the opportunity for community policing of the space.
18. To keep them at a pedestrian-scale, parks and plazas should not have an area greater than 0.25 to 1.0 acres within the densest part of the pedestrian district. Larger "neighborhood" and "community" parks should be located at the fringes of pedestrian-oriented areas, as they can become a barrier to safe pedestrian circulation and reduce overall intensity of use.

3.5.2 Density

Much research has been done to establish necessary densities for support of different transit types, while little effort has been put towards identifying the densities which can help to create a pedestrian-supportive environment. Yet the goals between transit-oriented development and pedestrian-oriented design are very similar. Both are trying to shape environments that encourage people to walk in an active and safe environment. Therefore, Table 3.2, listing example transit-supportive densities, provides a general guideline for densities which can help create a pedestrian-supportive environment.

While reviewing the following examples, keep in mind that "minimum average" densities represent the median of a range of recommended densities. This allows an area of transit-oriented development to contain types of homes that meet the needs and desires of a diverse cross-section of the population. Also, these density guidelines recognize that some people will choose to live in lower-density areas and not take advantage of access to transit. These ranges were arrived at through market assessments and "bargaining" amongst a cross section of stakeholders.

Before a community in the San Diego region adopts a minimum average for transit-oriented development they should assess the real estate market and undertake a public education and decision-making process.



Figures 3.9 and 3.10. Density is a design issue - both of these developments are 12 units to the net acre; Santa Rosa, CA

Table 3.2 Example Transit-Supportive Densities

Source	TOD Type	Residential Density
City of San Diego TOD Guidelines	Urban TOD (LRT served)	18 to 25 du/ac average
	Neighborhood TOD (Bus served)	12 to 18 du/ac average
LUTRAQ Study, Washington County, Oregon	Mixed-Use Center (LRT served)	15 du/ac minimum average (7 to 50 du/ac range)
	Urban TOD (LRT served)	15 du/ac minimum average (7 to 40 du/ac range)
	Neighborhood TOD (Bus served)	8 du/ac minimum average (5 to 20 du/ac range)
Portland Tri-Met, Planning and Design for Transit Handbook	LRT Served TOD	Up to 1/8 mile 30 du/ac 1/8 to 1/4 mile 24 du/ac 1/4 to 1/2 mile 12 du/ac
	Bus Served TOD	Up to 1/8 mile 24 du/ac 1/8 to 1/4 mile 12 du/ac 1/4 to 1/2 mile n.a.

Gradient

A gradient creates flexibility for a variety of land use and urban design components. Land uses, densities, building heights, setbacks, and other elements can be regulated such that they create higher levels of activity closer to a designated pedestrian-supportive area, leveling out at its perimeter to transition to surrounding development types and intensities. Land use gradients can be configured to encourage a greater mix of uses at the center and then transition to a single use that reflects the predominant use in the surrounding area. For example, uses should transition to residential buildings of similar character to a surrounding single-family neighborhood.

3.5.3 Strategies to Pursue

The approach you take in creating a pedestrian-friendly environment depends on the nature and scale of the development as well as the existing street network. Tools listed in Table 3.3 and elsewhere in these guidelines are applicable for new development on larger size vacant lands, infill and reuse sites within the existing urban fabric, and even at a city-wide comprehensive plan level.

A. Infill Development Considerations

Not having the "luxury" of starting from scratch in creating a community structure appropriate for pedestrian-oriented development, a municipality or property owner may have to start at the site design or detail design level to effect some change. Over time, as adjacent properties begin to redevelop, design principles can be applied until an entire district is created. The municipality however, can encourage this by making changes in the public right-of-way that support the eventual transformation of land uses in the area



Figure 3.11. Example of an urban infill project; Mercado development, San Diego, CA

Table 3.3 Tools for Creating Pedestrian-Supportive Areas.

New Development	Infill Development
<p>Identify goals for the community – what type of community or neighborhood are you creating? Even if the community is primarily residential, a pedestrian environment can be created where recreational, civic, service, and retail uses are within walking distance. A community structure can be created where these non-residential uses provide a neighborhood focus and good locations for transit stops to provide access to jobs and other services in the region.</p> <p>Think about all modes of transportation from the beginning – even in communities on the fringe of the region opportunities can be provided for people to walk, bicycle, carpool, or take transit for some of their trips. Remember that commute trips only account for 20% of a typical household's daily trips. Other trips can be non-auto or at least shorter auto trips if a community is designed with pedestrians in mind.</p> <p>Follow through in detail design – once the community structure of circulation and general land uses has been determined concentrate on the details of site planning, streetscape, and building design. Just because uses are within walking distance does not mean that people are encouraged to walk; shaded sidewalks, buildings fronting the streets, and other details are needed to create a pedestrian-friendly environment.</p>	<p>Re-zoning: in a prospective pedestrian-supportive area (i.e., in an existing urban or neighborhood core, around transit stations along important arterials, near schools, etc.) a municipality could change zoning for an area by either up or down-zoning, and by zoning a broader variety of uses. Up-zoning would be used to permit higher density residential, and down-zoning could hasten commercial development into concentrated development nodes with the space between appropriate for higher density housing and/or office.</p> <p>Overlay Zoning: Municipalities can consider the creation of pedestrian overlay districts (or transit-oriented overlay districts). These might include neighborhood centers, the downtown, business or industrial districts, activity nodes along a corridor, or transit station areas that could benefit from a more diverse land use pattern. Overlay districts allow developers to vary from the underlying zoning with the goal of improving public benefit as well as the value of development.</p> <p>Land Parcelization: Municipalities can encourage infill development by assisting in the creation of parcels that are at an appropriate scale for pedestrian design projects. In some cases parcels may be too small to support mixed-use development and the city can assist developers by assembling land into larger parcels. In cases of larger parcels city can provide guidance through zoning, public street dedications, or design standards to ensure that the infill development has a scale that supports pedestrian activity.</p>

such as widening sidewalks, installing traffic calming measures, planting street trees, etc. Furthermore, a municipality can either require or provide incentives to property owners so they provide amenities such as plazas, pedestrian pass-throughs, or a simple public bench on their property to support the vision of the neighborhood. A local example of this in the region is "Little Italy" in San Diego and in the downtowns of San Diego, Escondido, and El Cajon.

Context

It is reasonable to assume that an infill site has a surrounding context. The context can be beneficial by providing an existing community structure with which to work and can allow the new development to reinforce this structure and blend in with its surroundings. This is however, only beneficial if the surrounding context is pedestrian-supportive. If it is not, the new development may have to "take the lead" in revitalizing the surroundings in the

hopes that, over time, adjacent properties redevelop in a similar manner resulting in a pedestrian-friendly district.

Improve circulation linkages: If they do not already exist, connections should be made with the surrounding circulation system of streets. In this way the infill development can benefit the surrounding community and vice versa. Linkages should provide for all modes of transportation.

Provide complementary land uses: The uses within the infill project should also take the surrounding community into account so that the project and its surroundings benefit each other. Infill development can also serve as a catalyst for positive change in a district, such as areas of underutilized industrial buildings that can be transformed into a mix of housing and space for start-up businesses.



Figure 3.12. Otay Ranch, CA

B. New Development Considerations

Creating the community structure for a successful new development entails a well-connected circulation system, efficient land utilization and, contrary to urban development patterns of the recent decades that have typically emphasized land use segregation, designating a mix of complementary land uses. The goal is to achieve a robust community structure that can accommodate a range of uses and which is flexible enough to adapt to changing demographics and market pressures over time as the community builds out and matures.

Context

New large-scale development is often considered to be a "clean slate" allowing for unconstrained creation of a new community. In fact, most successful new developments reflect and complement their context. The context consists of the site's natural features, regional transportation system and land use patterns, and the economic conditions, as well as the goals of the local jurisdiction and the developer of the property.

3.6 Creating and Maintaining Community and Neighborhood Identity

Like any set of design concepts or guidelines, mixed-use, pedestrian-oriented design concepts can lead to repetitive and formulaic designs if consideration is not given to local context. Attention must be paid to creating and maintaining a community's or neighborhood's particular identity. This supports an identifiable community structure as discussed previously. "Neighborhood identity" refers to the ability of a resident or visitor to distinguish one neighborhood from others, as opposed to the increasing standardization in development that has occurred beginning in the late 1940s. Although such distinctions are at times subjective, criteria can be established to determine neighborhood identity. These criteria help identify existing positive attributes and how development can use them as guides for reinforcing community identity. Criteria can include:

- ◆ predominant land use and provision of a balanced land use mix,
- ◆ architectural and landscape character,
- ◆ historic resources (appropriate for adaptive reuse),
- ◆ dominant demographics,
- ◆ presence of neighborhood/community/regional amenities,
- ◆ definable edges/gateways, and
- ◆ regional land use and transportation context.

3.7 Circulation System

Pedestrians walk within a community's circulation system. It is the combination of the circulation system and land use patterns which determine the quality of the pedestrian environment. This section describes some basic transportation principles that will help to create more pedestrian-friendly environments.

3.7.1 Retrofitting an Existing Circulation System

It must be recognized that in many parts of the San Diego region, the existing circulation system is established and in many cases it is not conducive to pedestrian travel. It will need to be retrofitted to achieve pedestrian design principles. Changes can be made within public right-of-ways that can begin to "mend" a disconnected system. Measures include installing sidewalks in neighborhoods or



Figure 3.13. San Diego has a tradition of establishing neighborhood identity through the use of gateway signs.

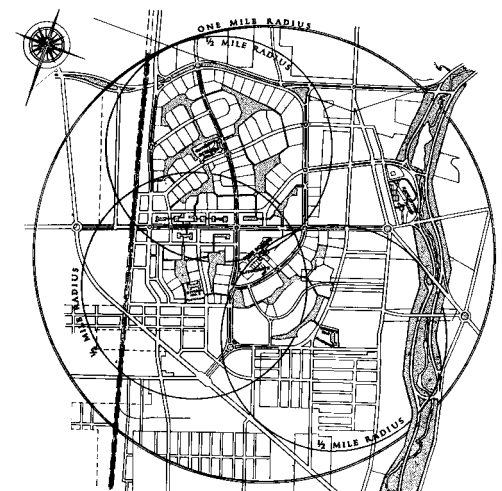


Fig. 27—General plan showing neighborhoods.

Figure 3.14. Plan for Radburn, NJ illustrating use of the 1/2 mile radius around neighborhood elementary schools (Clarence Stein, 1928)

pedestrian corridors where they are lacking, improving street crossings, and adding design elements to calm traffic (i.e., reduce the speed of turning movements, slow speed while maintaining traffic flow, etc.) Design solutions such as these are explained throughout the remainder of this chapter and in the following chapter regarding site and detail design.



Figure 3.15. The plan for Riverside, Illinois, demonstrates a system of streets both curvilinear and interconnected.

3.7.2 Planning New Development - Connected vs. Unconnected Street System

Since WWII the prevailing approach to suburban street design has been “dendritic,” a branching street system where the “trunks” (arterials and streets) connect with the “branches” (collector streets) which then connect to “leaves” (the systems of local streets) which are generally a disconnected system of cul-de-sacs and loops. This form was adopted for the purpose of reducing through traffic on local streets. Many of the arterials which result from this system are suitable examples of pedestrian-unfriendliness and promote the anonymous strip development visible today.

In situations where extreme topography precludes street connectivity, such as that found in the San Diego region, a system of pedestrian linkages can be created through the use of stairs, ramps, trails, pathways, and where linkages of key importance are made by bridges over canyons.

Pedestrian Pitfalls with the Unconnected Street Pattern

- ◆ Circulation systems in auto-dominated environments are often defined by a circuitous pattern that increases walking distances between points that are otherwise close. This presents an almost complete lack of consideration for the pedestrian who requires short distances for comfortable and efficient travel.
- ◆ The pedestrian is often required to walk through unpleasant and dangerous circumstances such as busy arterials and parking lots.
- ◆ Due to traffic noise and speed, most arterials and collector streets have few buildings fronting onto them, so the pedestrian is left in an environment that is dominated by speeding cars and sound walls.
- ◆ Development that does face the arterial is generally auto-oriented with street-facing parking lots.

Pedestrian Benefits of a Connected Street Pattern

- ◆ A highly connected street system will not force as much traffic onto arterial streets and allows motorists and pedestrians to travel relatively short distances to reach local destinations.
- ◆ Reduces the length of most trips by providing more direct routes.
- ◆ Allows arterials to more efficiently accommodate regional travel, often allowing more of the right-of-way to be used for pedestrians.
- ◆ Permits the development of a finer grain of local road patterns such as loop roads (rather than cul-de-sacs) to moderate through traffic flows in residential neighborhoods supporting a safe environment for children.
- ◆ Pedestrians have shorter and more direct connections between neighborhoods and arterial roads (generally locations for transit and other destinations).

Measurement of Connectivity: Block Size and Walking Distance

Creating an interconnected street system supports pedestrian activity because it disperses traffic and allows for the creation of streets that are comfortable for pedestrians. But the pattern of streets also needs to provide a relatively direct connection from place to place for pedestrians; we have all seen paths worn into grass (“desire lines”) by pedestrians who are trying to travel the shortest distance between two places.

Research by Anne Vernez Moudon at the University of Washington in Seattle compared two neighborhoods - one with an interconnected street patterns and one without. What she found was that in the connected system, actual walking distances were 1.29 times the length of straight-line distances. In the unconnected system however, walking distances were 1.6 times the length of straight-line distances.

A method for ensuring a comfortable walking distance is to establish a block length standard requiring that blocks be no longer than 380 - 450 feet in length between intersecting streets. Mid-block pedestrian pass-throughs can also be required more frequently, although their use should be limited because they may not be as safe for pedestrians as streets lined with active residential and commercial uses.

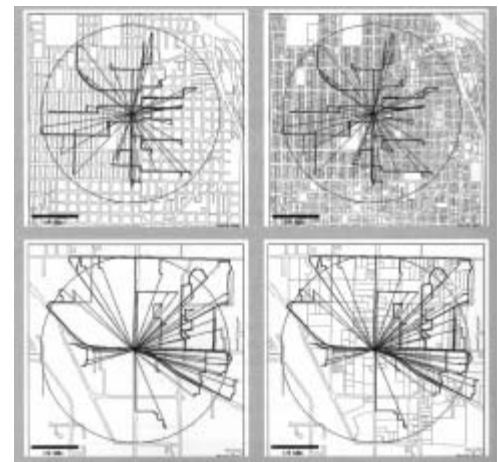


Figure 3.16. Pedestrian Accessibility Diagram. These diagrams illustrate walking distance in four neighborhoods in Seattle, WA. The circles are a 1/2 mile in radius, the lines radiating from the circle's center show direct distance from the center, and the indirect lines represent the walking distance from that point to the center. The two diagrams at the top illustrate neighborhoods with interconnected street networks, while the two on the bottom are more disconnected. The walking distances in the interconnected neighborhoods average 1.29 times longer than the direct distances, while walking distances average 1.6 times longer in the disconnected neighborhoods. (Anne Vernez-Moudon).

Guidelines

1. Create an interconnected street system to benefit all modes of transportation.
2. Blocks should be no longer than 380-440 feet long in pedestrian-supportive areas. In other areas, the goal is to minimize block lengths for pedestrians by providing at least a pedestrian connection every 250-300 feet (including sidewalks along streets or pedestrian paths through the block).
3. Signalized arterial streets should be connected to the surrounding street network by intersections a minimum of every 600 feet along the arterial street in pedestrian supportive areas. In other areas and where existing conditions preclude achieving full street connections, the spacing of streets should be a maximum of every 1000 feet with additional pedestrian connections being used to increase pedestrian accessibility.¹
4. Regardless of street type, streets with pedestrian generators such as schools, transit stops and civic centers fronting on to them should provide pedestrian crossings as close as possible to stops and entrances.

3.7.3 Traffic Management that Considers Pedestrians



Traffic management techniques are necessary to ensure that a circulation system is comfortable for pedestrians. Traffic management, though, is indelibly tied to physical structure. If it appears that a street is designed only for the rapid movement of autos, then the drivers are more apt to ignore other users. The disconnected street system previously described lends itself to this condition by essentially funneling traffic onto one busy arterial street.

Guidelines

1. 15 or 20 mph speed limits should be posted in zones of high pedestrian activity areas where pedestrians dominate the environment. A broader range, up to 25 to 30 mph, can be comfortable on "main streets" where parked cars, landscaping, and specialized crossings create a comfortable pedestrian environment.



Figures 3.17 and 3.18. Hazards created when crosswalks are not located where pedestrians need them - in this case, a bus stop

1. The Portland Metro Region has as connectivity requirements street intersections spaced at 12 to 14 per mile in intensely developed areas with pedestrian activity. Signalized intersections have a spacing requirement ranging from 600 to 2600 feet depending upon land use intensity with unsignalized intersections and driveways no more than 600 feet apart. Source: *Creating Livable Streets*, Metro, 1997.

Note: The California Vehicle Code allows decreasing the speed limit to 15 or 20 mph in business or residential districts where the roadway is less than 25 feet wide.

2. Time signal intervals should allow an average person to cross intersections comfortably rather than being prioritized only for traffic flow.
3. Where necessary, a central pedestrian safety island “refuge” should be installed for slower pedestrians (elderly and the disabled) who are unable to cross during one signal cycle (refer to discussion in Section 4.4.3 in Chapter 4).
4. Pedestrian activated warning lights should be utilized in locations where the number of pedestrians does not warrant a permanent traffic signal or existing traffic signals are spaced an excessive distance apart. The *Caltrans Traffic Manual* warrants a minimum of 100 pedestrian crossings per hour for any four hours or 190 or more during any one hour. Signals can be either overhead or embedded in the road surface. They can also be associated with mid-block crossings.
5. Right turns on red should be prohibited in busy pedestrian areas. A considerable proportion of auto/pedestrian conflicts occur when motorists' attention is directed towards oncoming traffic and they neglect to notice pedestrians entering the intersection on the right.

3.7.4 Pedestrians and Bicyclists: Maintaining a Safe Alliance

Cyclists and pedestrians are often spoken of in the same breath due to a perception that they have similar needs just because they are non-motorized. While an alliance between pedestrian and bicycle advocates does exist in some cases, in lobbying for funding of non-motorized transportation improvements, the alliance is often in conflict. The increasing limitations of transportation funds as compared to the needs for all modes of transportation leads to competition between bicycle and pedestrian focused projects. Also, the bicycle still operates like a vehicle, with speeds far greater than pedestrians, which can pose a serious hazard to both.

The following guidelines will help to resolve potential safety and design conflicts between pedestrians and bicycles, and can help in designing projects that improve the environment for both of these non-motorized forms of transportation.

Guidelines

1. In most cases, the appropriate location for cyclists along a street should be within the curb-to-curb area of the right-



Figure 3.19. Proper planning and design can ensure that pedestrians and cyclists comfortably co-exist.

of-way in either mixed-flow (where traffic volumes are lower) or within designated bicycle lanes along busier streets. Guidelines must comply with the state highway design standards.

2. In cases where speeds exceed 50 mph and dedicated bicycle lanes may be unsafe, a combined ped/bike path ("multiuse path") should be used. The path should be a minimum of 12 feet wide, and striping and signage should be provided to indicate direction of travel and who should yield to whom. An additional location where multiuse paths are appropriate is in the regions parks and canyons.
3. If the right-of-way is too constrained and traffic volumes are high then enhanced bike access on a parallel alternative route should be developed.
4. Safety signage should be installed at intersections of multiuse paths to warn cross-traffic and signage should indicate who yields to whom (refer to Chapter 1000 of Caltrans' *Highway Design Manual* for standards).
5. In areas of high pedestrian activity (transit stops, schools, playgrounds, etc.) cyclists should be clearly warned to slow down and signage should indicate who yields to whom.
6. Bicycle racks and lockers should be located in convenient, well-lit areas, clearly visible from a building's or a use's primary entrance, and no further than the closest auto parking stall (except disabled parking).
7. Bicycle parking should not interfere with pedestrian traffic, and should be protected from potential damage by motor vehicles.
8. In some locations, and for special events, secured bicycle parking with attendants should be provided to encourage bicycling. Appropriate examples include college campuses and sporting events.



Figure 3.20. The San Diego trolley

3.7.5 Transit Access

Defining the appropriate proximity of a transit facility to the surrounding neighborhoods will necessitate that each jurisdiction perform an assessment of the neighborhood. Unlike the hypothetical circumference of a walking radius, the neighborhood may have formidable barriers or a disconnected street pattern that greatly increases the actual walking distances and connections to the facility.

Table 3.4 illustrates the walking distance boundaries as defined within ordinances and guidelines of several jurisdictions with adopted Transit-oriented Development (TOD) regulations. It is suggested that the San Diego region adopt the quarter mile radius.

Table 3.4 Walking Distances to Transit Stations

Source	Distance of District Boundary
Seattle, WA	1/4 mile radius from LRT station
Hillsboro, OR	1300' radius from LRT station
Portland, OR	1/4 mile radius from LRT station
Washington County, OR	1/2 mile radius from LRT stations 1/4 mile radius from primary bus routes
City of San Diego, CA	2000' radius from transit stop

3.7.6 Parking Considerations

Parking is a necessity, but innovative planning policies can reduce the negative impact on the pedestrian environment, and again, land use and transportation need to be thought in conjunction. Typical parking standards specify the number of required spaces per square foot of use based on peak hour demand estimates for each separate use, thereby compounding the need for parking. Mixed-use development, on the other hand, will often include uses that have peak parking demands at different times. As an example, a mixed-use development on a parcel can take advantage of this by having ground floor retail and upper-story office development. Reductions can be justified where employees arrive by transit or auto, but shop and dine in the uses below. In turn, during more popular weekend shopping periods, the offices will typically be vacated, freeing parking spaces up for weekend users.



Figure 3.21. An inhospitable pedestrian environment

Parking strategies:

1. Reduce overall parking requirements by implementing shared parking ratios within mixed-use neighborhoods that recognizes that some uses have their peak parking demands during different times of the day and the week.
2. Establish simple parking agreements between users to manage access to spaces with the condition that use times differ to avoid demand conflicts. For commercial uses, valet parking allows for a more efficient method of parking cars and maximizing the number of spaces available. Agreements can occur between private businesses or between the

transit provider and private businesses. As an example, the transit station's park-and-ride facilities will primarily be used during daytime hours. Evening entertainment uses can take advantage of this by allowing patrons to use the lots during these times.

3. Allow for parking reductions when developments offer pedestrian amenities in exchange for parking spaces. Both developers and the community can benefit from this allowance. Developers can reduce their parking costs by offering less costly pedestrian improvements, while the community can gain these amenities and reduce the presence of cars.
4. Allow the substitution of bicycle parking spaces for auto spaces at a 5 to 1 ratio (as in Portland, OR). In allowing the substitution of bicycle facilities for parking, jurisdictions should also require businesses to provide shower facilities for employees who choose to commute via bicycle.
5. Parking should be restricted within the immediate area of a transit station. If park-and-ride parking is provided it could be located in a shared parking facility some distance from the transit station. This also increases pedestrian activity close to the transit station as people park at the fringes and walk to the stations or uses in the area.
6. Implement TOD zoning that reduces the underlying parking requirements within a TOD overlay zone. Parking minimums are typically a percentage of the parking requirement set for the underlying zone and its applicable land use.



Figure 3.22. Spreckels Park, Coronado

3.8 Public Open Space and Parks

Sensitivity to the surrounding landscape and provision of open space within a community is a necessary component to successful community planning and urban design. An underlying goal of pedestrian-oriented development is not only to make walking, and potentially, transit a viable alternative, but to facilitate access and preservation of valued open spaces. Furthermore, the function and distribution of public open space should meet the passive and active needs of the community.

Issues to Consider

- ◆ Open space can be used as a discernible edge to a community and a buffer between one and another.
- ◆ Public open space can be used to support the wishes of a community and the establishment of neighborhood

identity by incorporating natural and cultural features and landmarks.

- ◆ It is not necessarily the amount of open space but the quality and location of the open space that is of importance.
- ◆ In residential neighborhoods a well-located park can become the residents' "front yard" with homes fronting onto it. This means that the park will receive more care and increased surveillance, thereby improving safety.
- ◆ Open space can be an effective means of transitioning between two different land uses (i.e., between a residential neighborhood and a mixed-use employment center).
- ◆ Just as sensitively located open space is an effective community structuring technique, so too is a network of open spaces. One can think about this network as an "infrastructure for livability," for both pedestrians and bicyclists, as well as areas of flora and fauna.
- ◆ A networked system of open space has potential ecological benefits. For instance, if the open space were to trace the natural drainage patterns of an area it could facilitate a series of drainage swales and infiltration ponds for use during rainy seasons.

Guidelines

1. Public open space should be treated as an object itself and not be relegated to "leftover" spaces that are most likely ill-configured and poorly situated.
2. Where appropriate, public open space should be integrated with other land uses such as schools and other community facilities. This is more efficient, provides more direct pedestrian access, and increased activity can improve safety.
3. Urban open space should be lined with public uses so it will be a focus of its community. This makes it safer and more accessible to pedestrians.
4. Pay attention to the role of the street as an important public space element. Some streets may include pedestrian amenities such as bulb-outs, outdoor seating, special lighting and paving, and ample landscaping. These amenities allow streets to satisfy many passive recreation needs. Such improvements can also make walking much more pleasant and desirable.
5. Provide pedestrian and bicycle paths within open spaces that serve for both recreational and transportation needs, weaving paths for the sake of design should be avoided- a straight line is the most efficient way for pedestrians to walk.



Figure 3.23. Oceanside Civic Center

4. Site and Detail Design

4.1 Introduction

The previous chapter described how to create a community structure and transportation system that are supportive of pedestrians. Naturally though, when discussing Pedestrian-oriented Design sensitivity must also be given to the human-scale – the interface between the individual sites and the pedestrian. This chapter begins with a discussion of four significant considerations related to effective pedestrian design, and some overarching standards and guidelines that relate to these topics. These are:

- ◆ ADA Accessibility
- ◆ New Development vs. Retrofit
- ◆ Relation to Current Standards and Practices
- ◆ Relation to Transit

Following this is a discussion on how the context of the site and detail improvements should be considered. In other words, are they being applied in an urban, suburban, or a rural area and should the guideline or standard vary in these situations.

After these introductory discussion sections, the chapter provides recommended guidelines for site and detail design that are necessary to achieve the goals of pedestrian-oriented design. These deal with issues of street, sidewalk, and building design along with guidelines for parking, landscape, and open space. Recommendations are geared towards designers and planners who are establishing design guidelines for specific development sites, such as mixed-use village centers, retail or office centers, central business districts, as well as new residential neighborhoods or infill development sites; and to designers and engineers that are implementing the details of the transportation system both in the public and private realms. Individual property owners wishing to improve conditions on their site will also find these guidelines useful, as will residents, businesses, or workers who are looking to improve their neighborhood or district. Creating safe and attractive pedestrian environments can be an incremental process requiring parcel-by-parcel development or redevelopment with the eventual conversion of an entire neighborhood or district.



Figure 4.1.A fruit stand that adds vitality to a traffic island in Coronado



Figure 4.2. A pleasant, shaded and simply furnished sidewalk

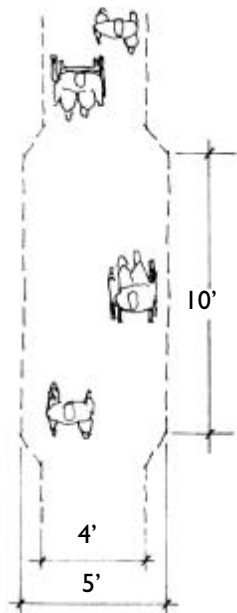


Figure 4.3. Accessible Passing Area (source: Architectural and Transportation Barriers Compliance Board)

4.2 ADA Accessibility

The following discussion focuses on the accessibility needs and requirements as defined by both federal and state (California Title 24) accessibility standards. Please note that different jurisdictions may have alternative interpretations of requirements and guidelines, and that some conflicts do exist between the federal and the state standards. Reference should be made to the local jurisdiction's ADA transition plans.

4.2.1 Understanding ADA & Designing for Various Disabilities and Ages

Millions of persons in the United States have some sort of permanent or temporary disability caused by injury, age or illness. The Americans with Disabilities Act (ADA) was signed into law on July 26, 1990. This civil rights law assures that a disabled person will have full access to all public facilities - primarily to public transit, public buildings and facilities and along public rights-of-way. Generally this involves removing barriers to wheelchairs and installing accessible wheelchair ramps.

It is essential however that the design of pedestrian facilities take into account the abilities and disabilities of ALL pedestrians. Mobility impairment is but one classification of disability, along with sensory deficits (the sight and hearing impaired) and cognitive impairments - those with diminished ability to process information including language barriers.

4.2.2 Eliminating Barriers for Disabled

In addition to the following guidelines, individual sections of the guidelines include discussions and guidelines pertaining to ADA accessibility issues.

A. Grades

1. There should be enough sidewalk cross slope for adequate drainage. The maximum cross slope should be no more than 2 percent for compliance.
2. Long, steep grades should have level areas every 400 feet for the pedestrian to stop and rest. In areas where it is impossible to avoid steep grades, an alternative route (such as an elevator in a nearby building) should be provided.

B. Walkways

3. Minimum unobstructed walkway width shall be 48 inches (Exceptions may be made to a minimum of 36 inches because of r.o.w. restrictions, natural barriers, or other existing conditions. Local agencies will decide what is an unreasonable hardship. For example, some jurisdictions are willing to allow light poles, etc. to reduce the width to 36 inches). The minimum width should be expanded when there is either a vertical barrier fronting the walkway or a vehicle travel lane. To understand how this requirement can be incorporated into the overall sidewalk design refer to section 4.5.1.
4. If a walkway is less than 60 inches (5 feet) wide there shall be a 60 inch x 120 inch (5 feet x 10 feet) passing space every 200 feet of length along the walkway.
5. At crossings, the installation of pedestrian bulb-outs should be considered in areas with a concentration of disabled pedestrians in order to reduce crossing times and exposure to traffic. Bulbouts also allow extra maneuvering space for those in wheelchairs, as well as larger pedestrian ramps.
6. Crossings that are unusual or uncommon, such as at midblock locations and roundabouts, need particular attention to assist disabled pedestrians such as tactile warning strips and audible signals.

C. Ramps

7. Ramps are defined as locations where the grade exceeds five percent, but may be a maximum of 1:12 or 8.3 percent.
8. The maximum rise for any single run should be 30 inches.
9. Where grades exceed 5 percent hand rails are required with the exception of curb ramps and some other special conditions.

D. Curb Cut Ramps at Intersections

10. Curb ramp should align in the direction of crosswalks, with two per corner at each intersection and at right angles to the curb, rather than having one "diagonal" curb ramp per corner.
11. The bottom of the ramp should be flush with the grade. [Note: this is the ADA requirement while the State of California's Title 24 requires a 1/2 inch beveled lip at the bottom of curb ramps].
12. Curb ramps or full cut-throughs 48 inches in width should be provided at channelization and pedestrian refuge islands.

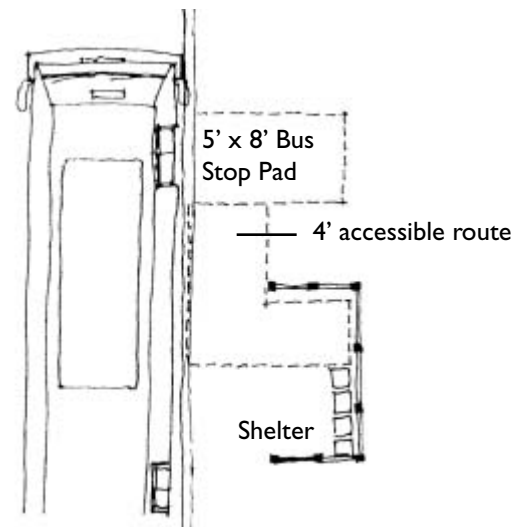


Figure 4.4. Accessibility Requirements at Bus Stops (source: Architectural and Transportation Barriers Compliance Board)

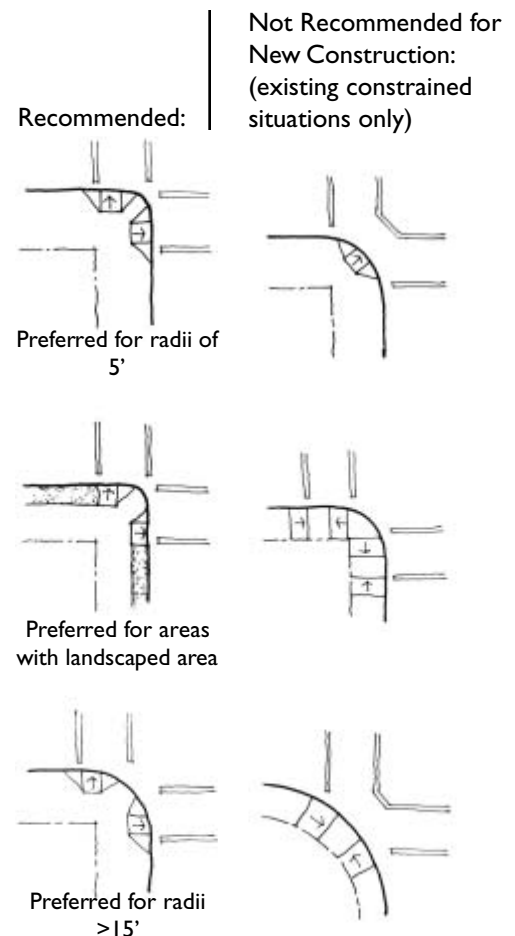


Figure 4.5. Typical Curb Ramp Placements



Figure 4.6. Tactile Warning Strips



Figure 4.7. Tactile Wayfinding Strip

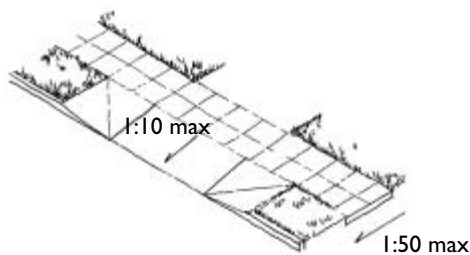


Figure 4.8. Preferred driveway condition

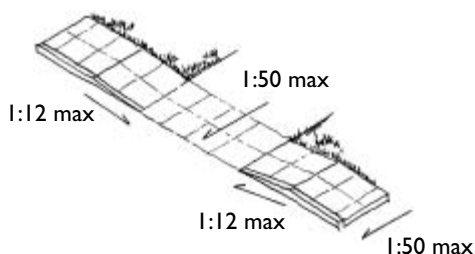


Figure 4.9. "Dropped driveway" for constrained width situations only

13. Storm drainage inlets should be placed on the uphill side of the curb ramps to prevent standing water at corner.

E. Driveway Design

14. Slopes for driveways shall comply with those given in Figures 4.8 and 4.9.

F. Textural, Audible, Vibrating and Visual Cues at Crossings

15. In areas with significant numbers of vision-impaired pedestrians, audible signals and braille instructions at pushbuttons should be considered.
16. Tactile cues should be used where crossings occur in an unexpected location. Wayfinding strips should extend between the expected and actual crossing location, while tactile bumps or grooves should be placed at either side of the crossing itself.
17. Pedestrian pushbuttons should be installed at signalized intersections in accessible locations and located no higher than 36 inches on the support pole.

G. Surfaces

18. All surfaces should be stable, firm and slip-resistant.
19. Surface treatments which include irregular surfaces such as cobblestone, can be difficult to navigate and should be avoided within the primary walkway area.
20. Sand should be added to the paint or thermoplastic used at crosswalks to reduce the risk of slipping.

4.3 Additional Areas of Consideration

4.3.1 New Development vs. Retrofit

These guidelines have been created to provide guidance for creating transportation improvements and development that are supportive of walking as a safe and viable mode of transportation. Guidance is provided both for new development and transportation systems in undeveloped areas, as well as for the retrofitting of existing streets and developed areas. This is important, because much of the San Diego region is already developed, and it is expected that much

future development will occur through the infill and revitalization of existing neighborhoods, districts, centers, and corridors.

Many of the guidelines are equally applicable to both new and retrofit development. But there are also special conditions and particular issues that must be considered in the application of the guidelines to either new or retrofit projects. These conditions and issues are highlighted in the following guidelines.

4.3.2 Relation to Current Standards and Practices

In addition to ADA, these guidelines have a relationship to and have been developed in consideration of several sources including the American Association of State Highway and Transportation Officials (AASHTO), Caltrans Highway Design Standards, Federal Highway Administration (FHWA) policies and standards, the Institute of Transportation Engineers design standards, and local standards, such as the on-going City of San Diego Street Design Manual initiatives. Where necessary in the guidelines, the reader will be informed of potential conflicts between the guidelines and the existing regulatory context.

The reader should keep in mind however that existing locally adopted standards and guidelines are also interpretations of many of these same source documents, and are also evolving to better reflect current research, values and regional context. For instance, to address a statewide need for community-sensitive approaches to transportation decision-making, Caltrans created the Office of Community Planning (OCP). The Office of Community Planning goal is to promote and participate in community based planning that integrates land use, transportation and community values. This department has shown a greater willingness to consider "livable communities" and "context sensitive design solutions" especially where State Highways serve as the Main Street for a community. Other references which could assist development of pedestrian-oriented designs include Caltrans DD 64 Accommodating Non-Motorized Travel, Caltrans Best Practices Manual for Bikes/ Pedestrians and the State of California Blueprint for Bicycling/ Walking.

4.3.3 Pedestrian Access to Transit

Pedestrian-oriented design is an essential component in the viability of transit. With the exception of park-and-ride lots at some transit stations, walking is a major part of every transit-user's trip. Because of this, site and detail design enhancements to the pedestrian realm improve the overall transit experience. Care must be taken in ensuring that any improvements will support existing or future transit systems and provide safe and direct connections between transit stops or stations and destinations in the neighborhood.



Figure 4.10.A bus stop in the Hillcrest neighborhood, San Diego

4.3.4 Urban, Suburban and Rural Considerations

There is not one standard set of detail and site design improvements applicable to all the conditions throughout the San Diego region. Urban, suburban, and rural environments have obvious differences in character and pedestrian needs. In these guidelines there is a discussion of "pedestrian-supportive areas." These areas are not only in urban cores. For example, a one block stretch of shops in a small "rural" inland community is the pedestrian core of the community and must be designed accordingly.

Where necessary in these guidelines, a discussion is made on how to apply them in areas with various levels of urbanity. Typically a "minimum requirement" is stated which is applicable to most conditions. A higher standard may be stated for pedestrian-supportive areas, and special considerations for urban, suburban, or rural conditions are provided as necessary.

4.3.5 Thresholds and Warrants

Where necessary, thresholds and warrants are provided for a variety of measures which are intended to increase pedestrian safety and create a more friendly pedestrian environment. Measures include:

- ◆ Addition of sidewalks and walkways
- ◆ Marked crosswalks
- ◆ Street conversions from 4 to 3 lanes
- ◆ Use of traffic calming features

The thresholds and warrants are based primarily on published standards and informational reports. It should be noted that many of the pedestrian crossing features presented in these guidelines do not have absolute thresholds for their use. They are generally used in combination to address prevailing conditions or perceived safety conditions based on the judgement of the engineer.

4.4 Street and Circulation System

4.4.1 Street Design

Section 3.7.2 in Chapter 3 outlined the benefits of connected vs. an unconnected street system, and recommended traffic management strategies that would support pedestrian vitality. At a site and detail design level, the design of streets must also consider the mobility and safety of the pedestrian ensuring that maximizing traffic capacity and speeds are not the dominant consideration in street design, particularly in pedestrian-oriented areas.

Section 4.6, Building Design, further discusses the interrelationship between streets and the buildings fronting them, and how elements outside of the public right-of-way can help support pedestrian safety and activity in the right-of-way.

Table 4.1, Pedestrian Measures Guidelines Matrix, located at the end of this section, matches road type with crossing and traffic calming facilities described within this chapter.



Figure 4.11. A wide intersection lacking pedestrian crossing facilities

Issues to Consider

General

- ◆ A prevailing condition in much of the San Diego Region is the location of buildings set back from the street which can result in a built environment that encourages traffic to travel at higher speeds.
- ◆ While it can be important to buffer residential neighborhoods from adjacent busy and noisy streets, the need to buffer should be balanced with the need for pedestrians to easily get from the neighborhood to transit or uses along busy streets.
- ◆ Excessively wide lanes encourage higher speeds on streets which then can divide a community.
- ◆ Frequent curb cuts along a street both impede traffic flow and create more conflict points between autos and pedestrians, and reduce the effectiveness of sidewalks as a pedestrian realm.
- ◆ Throughout the San Diego Region, there are canyons and mesas which make pedestrian connections difficult to achieve.
- ◆ The warm and mild climate in San Diego throughout most of the year creates opportunities to make pedestrian travel a realistic option for many people.



Figure 4.12. Streets such as this one were widened with little regard for accommodating the pedestrian.

ADA Accessibility

- ◆ Pedestrian facilities must comply with ADA standards and take into account the entire range of disabilities.
- ◆ ADA accessibility requirements most often help to create a better pedestrian environment, particularly for seniors as well as those with disabilities.

New Development vs. Retrofit

- ◆ The guidelines and standards describe the minimum desirable improvements in most cases, and in many cases discussions of trade-offs between different needs are discussed to help the reader identify the compromises that may be necessary in the retrofitting of existing streets and developments.
- ◆ Improvements to accessibility should consider both sides of the street.
- ◆ Neighborhoods evolve over time and the public right-of-way configuration has an influence as to what type of development occurs.
- ◆ Prior to improvements to an existing street, utilities such as lighting, electrical, and storm drains should be identified and either incorporated into the design or relocated.

Relation to Current Standards and Practices

- ◆ At a minimum, all streets must either be designed to published standards (but not necessarily the most conservative end of the allowable range), or with consideration for current practices by some agencies which may not yet be published.

Relation to Transit

- ◆ All streets which are directly served by transit should also be designed or retrofitted to serve pedestrians since there must be adequate facilities to access transit.
- ◆ Streets, sites, and buildings within an area that is walkable to transit stops should be designed or retrofitted to serve pedestrians.

Guidelines

1. A street should not be designed from the centerline out which invariably leaves little room for pedestrians. Rather, an appropriate amount of right-of-way (including sidewalk and landscaping) should be dedicated to the pedestrian. Section 4.5.1 discusses preferred sidewalk widths in both commercial mixed-use districts and residential neighborhoods.
2. Within pedestrian supportive areas the vehicle travel lanes should be 10 to 11 in width and parking lanes seven feet in width.
3. The radii of a curb at a street corner should take into consideration pedestrian safety and needs. Reducing the turning radius of an intersection corner can minimize the distance the pedestrian must cross (for further discussion see Section 4.4.2).
4. On-street parking should be encouraged as an additional buffer by allowing it to count towards parking requirements for adjacent uses (for further discussion see Section 4.7.1).
5. Parallel routes serving all forms of traffic should be considered when resulting curb-to-curb width may not be able to accommodate all other forms of traffic (i.e. a dedicated bicycle or transit lane, a parking lane, or a travel lane).
6. The number of pedestrian crossings should be maximized in order to prevent a street from becoming a barrier in the community (for further discussion see Section 4.4.3).
7. More frequent intersections along arterial roads (even if they only provide right-in and right-out access for cars), coupled with an overall interconnected system of roads, within the grid of arterial streets, should be built in new development. This will allow for better transit coverage, pedestrian access, and overall circulation and community aesthetics.
8. Access Control Plans should be developed for new and existing streets that consolidate access points to adjacent properties either through local access lanes, shared easements, or establishing access via less-busy cross streets (for further discussion see Section 4.4.5).
9. In new development, sidewalks should be located on both sides, but in particular conditions it may be appropriate to deviate:
 - ◆ Where constrained by severe topographical or natural resources;



Figure 4.13.A well-buffered sidewalk in a commercial district



Figure 4.14.The Dutch “woonerf” street

- ◆ Some public streets in more rural settings may not be appropriate for a typical curb, gutter and sidewalk section. In these areas, some type of paved, potentially multiuse, walkway should be provided, but not necessarily on both sides of the street if traffic levels are low enough to allow frequent and safe crossings.
 - ◆ In cases where traffic volume is low and traffic speeds are mitigated by either on-street parking and/or narrow road width. In this situation the absence of sidewalks may create a slow pedestrian street (also known by the Dutch name “woonerf”) where vehicles and pedestrians equally share the road. Under similar circumstances, having a sidewalk on only one side allows for more landscaping to front directly on the street and may create a more “rural” character if appropriate.
10. For retrofitting or improving existing rights-of-way sidewalks should be constructed. Where the existing right-of-way is too narrow to accommodate sidewalk construction, additional right-of-way or public walkway easement should be acquired or the existing roadway narrowed but remain in accordance to established minimum roadway standards.

A. Pedestrian Measure Guidelines Matrix

The matrix shown in Table 4.1 provides guidance on the use of various pedestrian measures by type of roadway. This matrix is intended to demonstrate the type of roadways which are most appropriate for use of various pedestrian measures. The road types ranges from low-volume/low-speed residential streets to Main Streets to higher-speed/higher-volume arterials.

Typical of most streets which serve pedestrian traffic, the need for pedestrian facilities and enhancements is generally focused on smaller sections rather than entire corridors. These hybrid “streets” serve a variety of traffic functions from main street activity to regional commute routes. An example of a hybrid street is San Diego County is the Pacific Coast Highway which operates as a regional arterial between communities, but also as main street within communities such as Encinitas, Solana Beach and Del Mar. The guidelines presented here should be applied based primarily on the operation and function of the street on a block by block basis rather than on a general corridor basis considering the overall classification of the road.

Table 4.1. Pedestrian Measures Guidelines Matrix

	Residential	Residential	Residential Collector	Main Street/CBD	Commercial >2 lanes	Minor Arterials	Arterials	Major Arterials
Volume (vehicles per day)	< 1,200	1,200-2,000	2-5,000	<10,000	7-15,000	10-15,000	15-20,000	>20,000
Typical speeds (mph)	15-25	25	25-30	25-30	30-35	30-35	35-40	35-45
Special Xwalk Markings								
Overhead Signage								
Bulbouts								*
Colored/Textured Xwalks							*	
Midblock Crossings								
Refuge Islands								
Staggered Crosswalk								
Pedestrian Corral								
In-Pavement Lights								
Roundabouts								
Speed Tables								
Traffic Circles								
Diverter								
Chicanes								
Overpass/Underpass								

* Possibly appropriate where arterial serves as a community's "Main Street."

Table Key

Most appropriate	Moderately Appropriate	May be appropriate with mitigating circumstances

B. "Discovering" Additional Right-of-Way

Improvements to the pedestrian realm do not necessarily entail acquiring additional public right-of-way. Often the additional width for sidewalks can be found in resizing the travel, turning and parking lanes. Figure 4.15 illustrates two cross sections: the first is a "typical" section for a four-lane urban collector street with a center median/turning lane; the second is the same right-of-way reconfigured to allow 16 foot sidewalks.

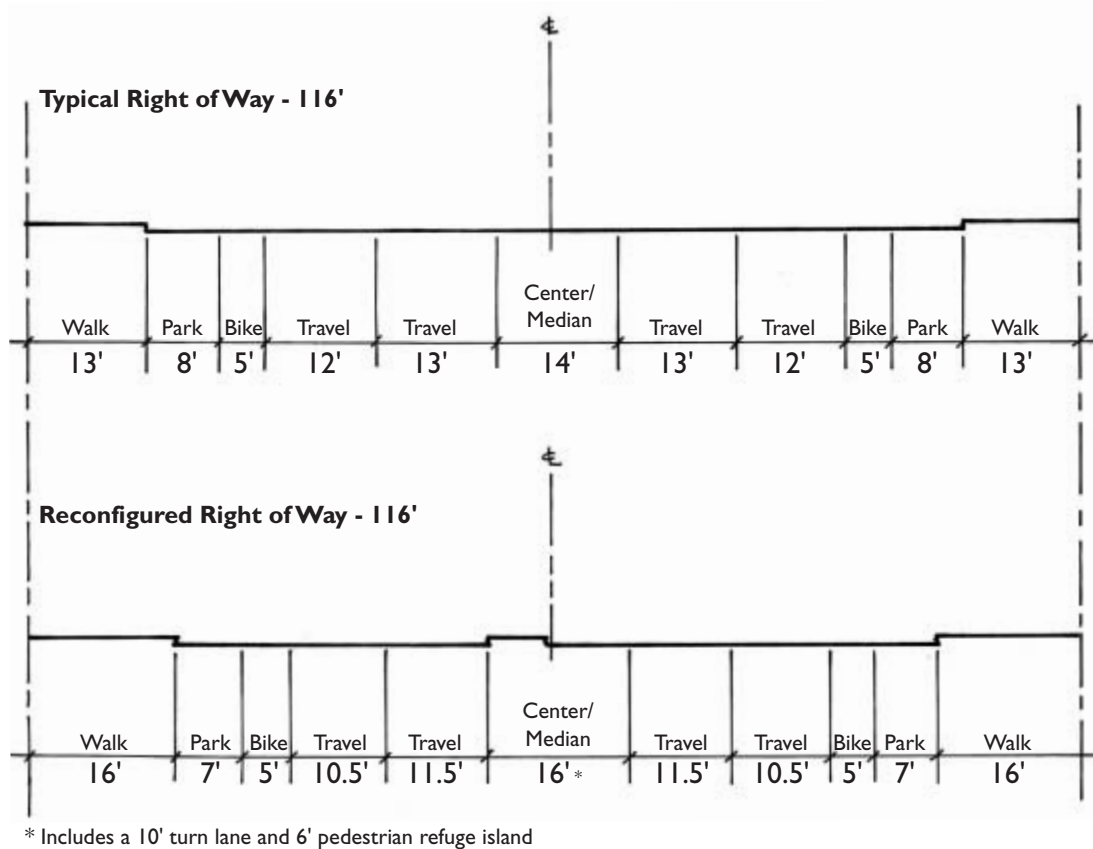


Figure 4.15. Increasing pedestrian facilities within an existing right-of-way

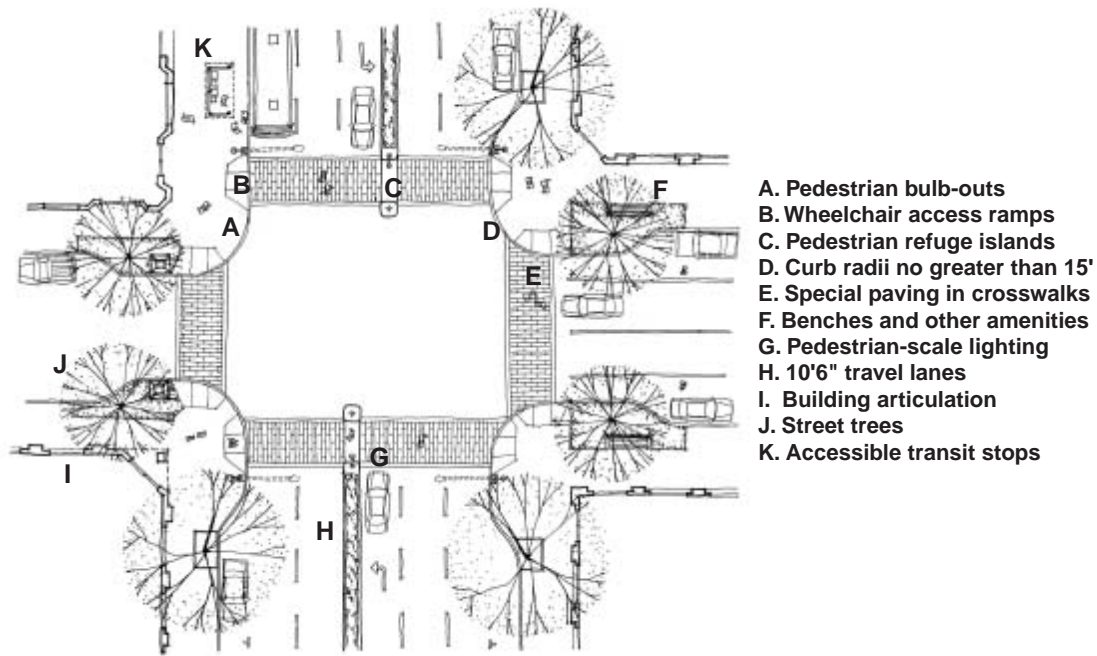


Figure 4.16. Elements that make for a pedestrian-friendly intersection

4.4.2 Intersection Design and Operations

The word “intersection” means more than just the meeting of two (or more) streets but also suggests the location of the intersection between the auto realm and the pedestrian realm. It is because of this that intersections are often the most vital areas along a street, but they also the point of most conflicts between vehicles, pedestrians, and bicycles.

Intersections must be designed with pedestrian safety and accessibility in mind. If pedestrians are either not allowed to cross or are discouraged from crossing, then walking as a mode of travel is discouraged. The spacing of intersections or crossing points is also an important element of creating a pedestrian supportive environment; this is discussed in the previous chapter in Section 3.7.2: Connected vs. Unconnected Street System.

This section describes how intersections can be made more pedestrian friendly by reducing crossing distances and improving visibility for both the pedestrian and the driver. Detailed discussion of specific crossing designs and elements is included in the following Section 4.4.3 Pedestrian Crossings.



Figure 4.17. Excessively wide intersections such as this one require more thought be given to the comfort of the pedestrian.

Issues to Consider

General

- ◆ Pedestrians should be made as visible as possible since multiple conflict points for vehicles and pedestrians exist at intersections.
- ◆ Intersections which limit the crossing distance, crossing time, and exposure to traffic tend to be more acceptable to pedestrian travel.
- ◆ Drivers traveling at a slower rate of speed have more time to process and react to pedestrian conflicts at intersections.

ADA Accessibility

- ◆ Pedestrian facilities including curb cut ramps, signal equipment, etc., must comply with ADA standards and take into account the entire range of disabilities.

New Development vs. Retrofit

- ◆ Prior to improvements to an existing intersection, utilities such as lighting, electrical, and storm drains should be identified and either incorporated into the design or relocated.
- ◆ New intersections provide the opportunity to clarify new forms of traffic control such as roundabouts which may provide a more pedestrian-friendly setting.

Relation to Current Standards and Practices

- ◆ Current standards and design guidelines, such as those published by Caltrans, are primarily focused on street standards which serve high capacity high speed corridors; although Caltrans is beginning the process of defining a more flexible approach for state highways based upon the context of the roadway in their publications “Flexibility in Highway Design” and “Context Sensitive Solutions. When Main Street is a State Highway.” In order to provide for more pedestrian friendly design, consideration is given to current practices by some agencies which may not yet be published.

Relation to Transit

- ◆ The location and design of transit stops at intersections should consider the access needs of adjacent land uses which generate pedestrian demand for transit as well as pedestrian and traffic safety issues at the intersection.

A. Turning Radii

The size of a corner radius (known also as a “curb return radius”) can have a significant effect on the overall operation and safety of an intersection. Larger turning radii promote both fast vehicular speed and increase the walking distances for pedestrians. Larger turning radii also erodes the pedestrian realm often leaving less space for pedestrians to wait before crossing the street.

Alternatively, too small a radii can impact the overall efficiency of an intersection, and possibly increase the potential of a pedestrian being hit by a turning vehicle while waiting at the corner.

Issues to Consider

General

- ◆ The wider the turning radius, the greater distance the pedestrian must cross.
- ◆ As the corner turning radius increases, generally over 30 feet, the likelihood of automobiles making a right turn stopping decreases since a “free right” movement is essentially created.

ADA Accessibility

- ◆ Turning radii have an effect on the location of curb ramps and the clear distance from the top of the ramp to the back of the sidewalk.

New Development vs. Retrofit

- ◆ While retrofitting a corner to reduce the radius can be relatively simple, storm drains and ADA curb ramps located at corners will need to be relocated.

Relation to Current Standards and Practices

- ◆ Section 405.8 (City Street Returns and Corner Radii) in the Caltrans Highway Design Manual provides guidance in designing these elements:

The pavement width and corner radius at city street intersections is determined by the type of vehicle to be accommodated taking into consideration the amount of available right of way, the roadway width, the number of lanes on the intersecting street, and the number of pedestrians.

Smaller radii of 15 to 25 feet are appropriate at minor cross streets where few trucks are turning. Local agency standards may be appropriate in urban and suburban areas.

Encroachment into opposing traffic lanes should be avoided or minimized. (Although the Caltrans design guidance does not indicate how much encroachment is too much, it should be

Wider turning radius
increases crossing
distance

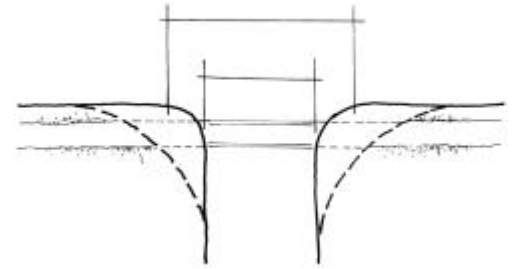


Figure 4.18. Turning radius effect on crossing distance

kept to no more than one or two feet for the majority of trucks which utilize the intersections. There may be a small number of trucks or vehicles which encroach further into the lane).

- ◆ These Caltrans guidelines do not necessarily account for downtown streets where there is a conflict between the need to serve truck deliveries and pedestrian crossings.

Relation to Transit

- ◆ Increasing the length of straight curb can help allow adequate stopping area for transit.
- ◆ Curb radii and intersection design need to consider the volume of larger vehicles, such as buses, that will make turning movements at an intersection.

Guidelines

1. Appropriate corner radii should be selected based on reasonably anticipated traffic volumes, traffic types, and the intersection control devices proposed or in place, as well as the amount of pedestrian activity in the area.
2. Curb radii at intersections within pedestrian areas should be 10 to 15 feet where curb bulbouts are not used. While wider curb radii (25'-30') may be generally preferred where vehicle capacity is an issue, wider radii can result in higher speeds by vehicles in turning right at intersections. This however not only increases the distance pedestrians have to walk, but it also puts them at risk of greater bodily injury as the greater maneuverability of large turning radii allow drivers to turn corners at higher speeds.

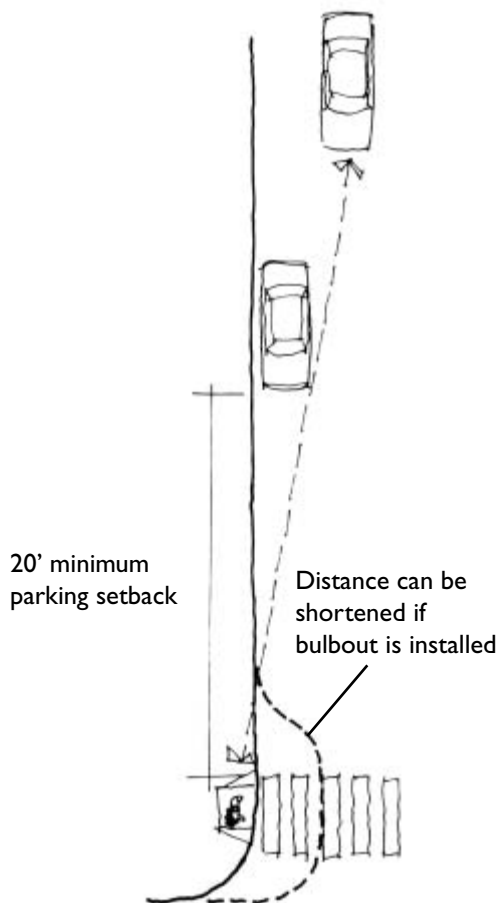


Figure 4.19. Preferred parking setback for sight distance

B. Sight Distance

More often than not, sight distance is discussed only from the standpoint of the driver and not from the pedestrian. This is particularly a concern at crosswalk locations where parked cars, utility poles, street furnishing or landscape can obstruct the line of sight for the pedestrians.

Issues to Consider

General

- ◆ The sightlines of traffic approaching an intersection on a significant grade are compromised.
- ◆ Sightlines for vehicles at an intersection are affected both by buildings, street trees, street furniture, etc. as well as by the location of the stop line relative to the intersection.
- ◆ Slower moving streets which support pedestrian movements allow for the placement of elements such as trees

and medians with landscaping. Although these features may restrict sight distance of downstream roadway conditions and traffic control devices such as traffic signals, their presence creates a slower speed environment which is more conducive to pedestrians.

ADA Accessibility

- ◆ Persons in wheelchairs and small children may not be visible to the driver with on-street parking present.

Relation to Current Standards and Practices

- ◆ AASHTO Green Book recommends a 90-degree angle of roadways, whenever possible.
- ◆ The Caltrans Highway Design Manual defines stopping sight distance requirements based on the approaching speed of vehicles. (Section 201.3) These standards range from 125 feet for speeds of 20 mph to 360 feet for speeds of 45 mph.

Guidelines

1. Parking restrictions near crosswalks should be considered to remove potential obstructions to the pedestrian's line of sight, particularly young children and those in wheelchairs. In typical urban areas with speed limits between 20 to 30 mph as well as in school zones, the no parking zone should extend a minimum of 20 feet from the crosswalk. This can also facilitate the implementation of curb bulb-outs (see Section 4.4.3).
2. When street furnishings or other objects that obstruct view can not be relocated, pedestrian bulb-outs should be considered.

4.4.3 Pedestrian Crossings

One of the most effective means of turning an important corridor into a community "spine" or "seam," rather than a "divider," is providing for safe street crossings. In 1970, the City of San Diego Traffic Engineering Department published *Pedestrian Crosswalk Study: Accidents in Painted and Unpainted Crosswalks* (Project PS 69-2-001 by Bruce F. Herms) and concluded that marked crosswalks were more hazardous to pedestrians than unmarked ones. This study eventually led to the removal of crosswalks throughout San Diego. The evaluation methods used in the study are disputed today by traffic professionals. Therefore, in addition to enhancing existing crossing through the use of physical measures, the need to provide a simple striped crosswalk where warranted should be an



Figure 4.20. It is essential that pedestrians feel safe crossing streets.

important issue in the San Diego region. Over the last 10 years, advances in pedestrian design have lead to a wide variety of measures which increase the driver's perception of the pedestrian and decrease pedestrian collisions or potential for collisions, thereby presenting the opportunity to provide enhanced marked crosswalks which better serve the pedestrian community.

Table 4.3 at the end of this section illustrates a set of street crossing prototypes from across the country utilizing a combination of the techniques described in this section. Reference should also be made back to Table 4.1 for matching crossing design with road type.

Issues to Consider

General

- ◆ The width of the street, the geometry of the intersection, the timing of signalization, and the frequency of crossing opportunities all play important roles in achieving a pedestrian-friendly environment.
- ◆ Closing a crosswalk does not mean that pedestrians will not continue to try to cross a street in that location.
- ◆ To eliminate the temptation of jaywalking, crossing opportunities should be provided at regular and convenient intervals.
- ◆ Marked crosswalks are useful in channelizing pedestrian crossing activity at specified locations.
- ◆ Marked crosswalks identify appropriate crossing locations for pedestrians and alert drivers to the possible presence of pedestrians.
- ◆ The use of marked crosswalks is generally considered appropriate at signalized intersections where pedestrian activity occurs.
- ◆ Street width and traffic speed can be mitigated with the use of sidewalk bulb-outs. The concept has been widely applied in existing downtown areas with revitalization and streetscape improvement efforts, but is equally applicable to new roads.
- ◆ Some pedestrians may become overconfident or be less aware of vehicles when crossing in a marked crosswalk. Therefore, marked crosswalks should not be used indiscriminately.

ADA Accessibility

- ◆ Signal timing should be long enough to allow a pedestrian with limited mobility to cross the street, and needs to be balanced with the desire to limit the time between signal cycles.

- ◆ Appropriate ADA ramps and signal devices should be provided at all pedestrian crossings and median refuge areas.

New Development vs. Retrofit

- ◆ Pedestrian refuge islands and bulbouts can be effective retrofit improvements that serve pedestrians who are unable to cross during one signal interval, or in situations where there are no pedestrian signals and the road is excessively wide.
- ◆ Textured paving or speed tables are effective means of retrofitting streets to let drivers know that they are in a pedestrian oriented area (refer to Section 4.4.4).

Relation to Current Standards and Practices

- ◆ Motor vehicle operators generally do not comply with the vehicle code which requires them to "yield" for pedestrians in a marked or unmarked crosswalk. However, drivers may be unfamiliar with the requirements of the vehicle code, therefore, communities must be creative in enhancing drivers' awareness of the pedestrian.
- ◆ There are several recent manuals which provide guidelines on pedestrian crossings based on more recent safety research.
- ◆ For the first time, details on innovative pedestrian crossing treatments for both signalized and unsignalized intersections have been published in a document by the Institute of Transportation Engineers, *Alternative Treatments for At-Grade Pedestrian Crossings*, 2001. This source described a number of measures including those incorporating signing, striping, lighting, vertical displacement treatments, horizontal displacement, narrow lanes, curb extensions, alternative surface treatments, backdrops, overhead devices, in-pavement devices, signal equipment, pedestrian detection, etc. The study included the following conclusions:
 - Agencies are currently using a variety of low-cost signing and striping techniques, that can improve the safety of the majority of marked crosswalks at uncontrolled locations on high-volume, multi-lane facilities.
 - There are a number of higher-cost geometric design features, such as curb bulb-outs and pedestrian refuge islands, that can be used to improve safety of marked crosswalks, especially those on high-volume, multi-lane facilities.
 - Areas of high pedestrian activity benefit most from being designed in ways that promote pedestrian

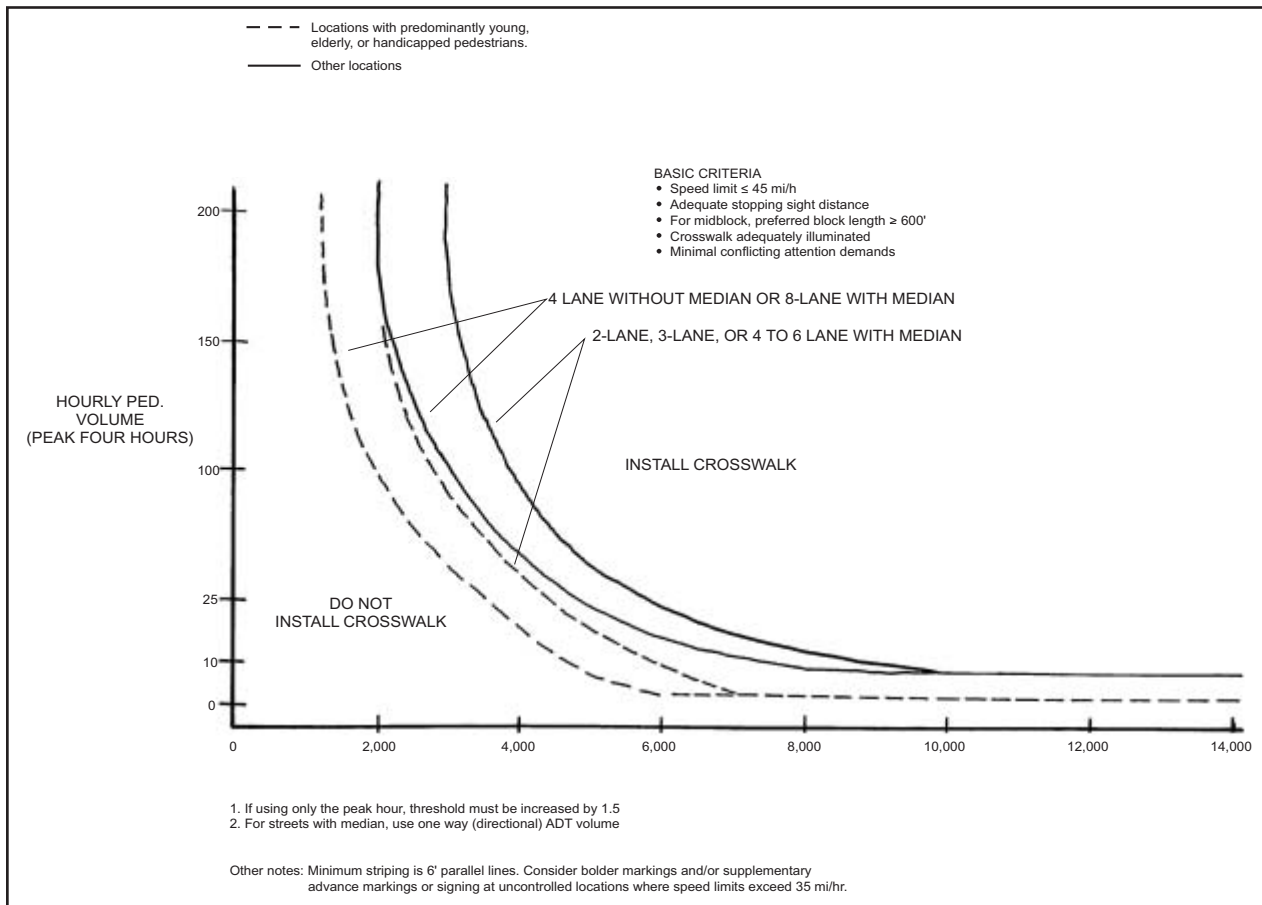


Figure 4.21. Guidelines for Installation of Marked Crosswalks at Uncontrolled Intersections and Mid-Block Crossings (Source: Smith, S.A. and R.L. Knoblauch, Transportation Research Record 1141)

activity and afford pedestrians a reasonable measure of comfort and safety when crossing streets.

- Lower speed streets such as those found in active mixed-use areas and residential neighborhoods, allow the use of less expensive, less complex treatments such as signs and markings.

Relation to Transit

- ◆ All transit stops require that pedestrians be able to cross the street safely and within close proximity of the stop.

Guidelines

1. Guidelines for installation of marked crosswalks at uncontrolled intersections and midblock crossings based on traffic volumes, pedestrian volumes, speed and number of lanes are shown in Figure 4.21.
2. The width of crosswalks should be a minimum of 12 feet wide. Unless small-scale intersection conditions dictate otherwise widths should be increased where there is greater amounts of pedestrian activity.

3. Adequate lighting at the levels specified in Section 4.5.3 should be present.
4. Marked crosswalks should be considered for uncontrolled crossing locations if there are no controlled crossings (by a traffic signal or stop sign) within 600 feet of the proposed crossing location (provided that the other guidelines presented here are met.)
5. Unless circumstances dictate otherwise, marked crosswalks should be provided at all signalized intersections where pedestrian crossing equipment is provided.
6. Marked crosswalks alone are insufficient (i.e., without traffic-calming treatments, traffic signals, pedestrian signals (when warranted) or other substantial crossing improvements presented in these guidelines) and should not be used under the following conditions:
 - Where the speed limit exceeds 40 mph.
 - On a roadway with four or more lanes without a raised median or crossing island that has (or will soon have) an ADT of 12,000 vehicles per day or greater.
 - On a roadway with four or more lanes with a raised median or crossing island that has (or will soon have) an ADT of 15,000 vehicles per day or greater.
7. Special crosswalk markings like those in Figure 4.22 should be used in order to increase the visibility of the crosswalk and on uncontrolled approaches to unsignalized intersections. These special markings are generally more appropriate on roads where the adjacent land use may divert drivers' attention.
8. Traffic signals should provide pedestrians, including seniors, the disabled, and children, with adequate time to cross the street or at least reach a pedestrian refuge in the middle of the street. An average walking speed which has been used historically is 4 feet/second to determine signal duration. However, a reduced speed such as 3.0 or 3.25 feet/second should be applied to compensate for the elderly and disabled.
9. Signal timing in #8, will have to be balanced with signal frequency. Ideally, pedestrian signals should be at a cycle frequency such as 60 to 90 seconds in order to dissuade jaywalking.
10. ADA-compliant wheelchair ramps (two per corner preferred) should be provided at all crosswalks. If a raised central median extends into the crosswalk, an ADA-compliant channel must be provided through the median.

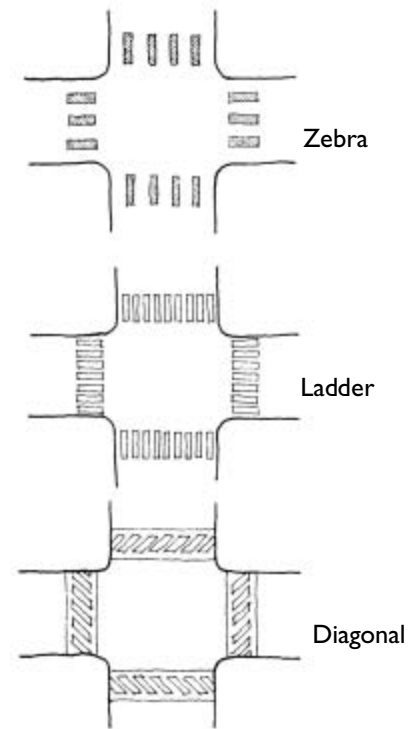


Figure 4.22. Typical Crosswalk Striping Patterns

Table 4.2 Devices at Traffic Signals

Device Type and Description	Application
<i>Early pedestrian release intervals</i> permit the pedestrian to begin crossing prior to the release of companion vehicle movements, establishing a clear presence in the crosswalk	At locations where pedestrian crossing times exceed the vehicle green time necessary to maintain acceptable service levels
<i>Animated eye indications</i> are added to the pedestrian signal to remind pedestrians to be aware of vehicle conflicts (the eyes appear to look left and right)	At intersections with large numbers of turning vehicles which may conflict with vehicle crossings
<i>Passive pedestrian detection devices</i> monitor the presence of pedestrians to permit an extension of the crossing time interval. Pedestrians entering the curbside detection zone will activate the pedestrian call feature	Slower pedestrians detected within the on-street detection zones will also receive more time to cross the street
<i>Count-down pedestrian signals</i> indicate the time remaining for the flashing "Don't Walk" interval. Being aware of the time remaining, pedestrians can increase their pace or decide not to initiate the crossing at all	Most effective at wide crossings
<i>Audible pedestrian signals</i> provide an indication to pedestrians of direction and commencement of the walk interval at signalized intersections	Useful when the pedestrian walk interval is short or when early pedestrian release intervals are used. (The audible signals should not be used near residences and should be muted at night)
<i>Enhanced pedestrian push buttons</i> aid persons with physical disabilities in safely crossing streets. The buttons are sized larger, may be lit or make noise to indicate activation, and may be faced with braille instructions	All places

A. Devices at Traffic Signals

Issues to Consider

- ◆ Pedestrian safety may be improved at signalized intersections by enhancing traffic signal equipment and/or providing more information to pedestrians.

Guidelines

1. Consideration should be given to devices explained in Table 4.2 for improving crossing conditions and illustrated in Figure 4.23.

B. Pedestrian Crossing Signage

Issues to Consider

- ◆ The use of signing in pedestrian areas is critical and is one of the more cost-effective means of increasing driver awareness.

Guidelines

1. Pedestrian signs should be installed according to the guidelines set forth in the *Caltrans Traffic Manual*.
2. Pedestrian crossing signs (W54) should be used adjacent to all unexpected pedestrian crossing areas.
3. One drivers-side sign is appropriate on two-lane lower-speed roads.
4. Two signs facing each direction should be installed on roads with more than two lanes, higher speed roads, or roadways with medians (with one sign on the median where medians exist, otherwise on the opposite side of the street).
5. The color of all pedestrian crossing signs should be "Fluorescent Yellow-Green" per the *Manual on Uniform Traffic Control Devices* (MUTCD). A MUTCD revision (Final Rule Docket No. 96-9, RIN 2125-AD89) adopted the optional use of fluorescent yellow-green (FYG) for warning signs related to pedestrians, bicycle and school applications.
6. Overhead pedestrian crossing signs should be installed on streets with four or more lanes or two or three lane roads with widths greater than 50 feet at crossings where pedestrian crossing activity is more than 50 to 100 crossing per hour or where sight distance of the driver may not allow view of roadside signs.
7. Pedestrian symbol signs (W54A) should be installed in advance of pedestrian crossings at isolated crossing areas. These signs are typically not used in urban areas at intersections or where motorists would normally expect pedestrians.
8. Although not Caltrans compliant, "Share the Road" signs should be installed on major roadways as they enter concentrated pedestrian areas such as business districts, and along heavily traveled bicycle routes, as well as at other selected locations throughout the region.



Automated Eyes



Audible Signal



Countdown Signal



Passive Pedestrian Detection



Accessible Push-button Signal

Figure 4.23. Pedestrian Devices at Signals



Figure 4.24. "Share the Road" sign (non-compliant with Caltrans)



Figure 4.25. Example of pavement striping defining travel lane



Figure 4.26. Example of advance stop bar pavement striping

C. Pavement Striping

Issues to Consider

- ◆ Pavement striping can be utilized to direct drivers' attention to the presence of pedestrian crossing areas.
- ◆ Placing advance stop bars so that they are set back several feet from a crossing or intersection can reduce the number of blockages created by stopped vehicles, and can lead to increased visibility of pedestrians.
- ◆ The narrowing of vehicle travelways, created by modifying the placement of edgeline striping or installing of bicycle lanes, may slightly reduce vehicle speeds and increase driver awareness in active pedestrian areas.

Guidelines

1. Special crosswalk striping should be used at all midblock crossings, and used to attract driver attention at intersections determined by engineering staff to have pedestrian safety concerns.
2. The advance stop bar can be enhanced with the addition of a "Stop Here for Pedestrian" sign. The effectiveness of the advance stop bar depends on motorist compliance with the marked stop line, and if placed too far in advance of the crosswalk, motorists may ignore the line. These markings may be unpopular in districts which desire less traffic related visual clutter.
3. In commercial areas with pedestrian activity, and where vehicle lane widths are greater than 12 feet, consideration should be given to striping edgelines so as to visually narrow the roadway.

D. Residential Street Crossings

Issues to Consider:

- ◆ Enhanced pedestrian crossings in residential neighborhoods are a key component of pedestrian-oriented street design, and lead to both improved pedestrian safety and the "livability" of the neighborhood.
- ◆ Residential street crossings are often combined with traffic calming measures that are designed to maintain low vehicle speeds, such as raised crosswalks, chicanes, and gateway narrowings. Refer to section 4.4.4 Traffic Calming
- ◆ Enhanced pedestrian crossings in residential neighborhoods may not be used if traffic volumes are low enough that pedestrians are comfortable crossing at any location.

Guidelines

1. Marked crosswalks in residential areas should be warranted if traffic volumes exceed 2,000 vehicles per day.
2. Enhanced pedestrian crossing measures should be considered in residential neighborhoods where a demonstrated crossing demand exists.
3. On residential streets that experience excessive vehicle speeds, enhanced pedestrian crossings should be combined with traffic calming measures. Certain devices, such as raised crosswalks and raised intersections, function both as a pedestrian crossing and as a traffic calming device.

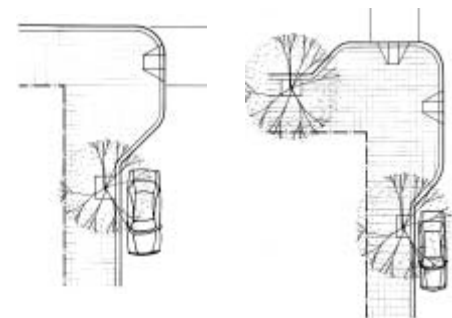
E. Pedestrian Bulbouts

Issues to Consider

- ◆ Pedestrian bulb-outs reduce pedestrian crossing distances at intersections and make pedestrians more visible to drivers. The extensions often occupy space formerly used as a parking lane.
- ◆ Curb extensions result in a reduced corner radius, which tends to help pedestrians by slowing the speeds of turning vehicles.
- ◆ Larger vehicles such as trucks and buses may have difficulty making right turns at intersections with curb extensions. Where there is difficulty, the curb extension can be designed with a mountable or rolled curb, but still differentiated from the roadway with pavement color and texture or bollards. However, any bollards, poles or street furniture must be kept back from the large vehicle wheel tracking which may mount the curb.
- ◆ Installation often involves removal of on street parking. Added costs may be associated with relocation or accommodation of utilities and drainage. Drainage costs may be reduced by maintaining the existing gutter, constructing the curb extension as an island and spanning the sidewalk to the island with a metal grate. See Figure 4.27. This approach will require special maintenance to remove debris.

Guidelines

1. Curb extensions should be used on crosswalks in heavy pedestrians areas where parking may limit the driver's view of the pedestrian.



"Half corner"

"Full corner"

Figure 4.27. Pedestrian bulbout types



Figure 4.28. The installation of this pedestrian bulbout required a trench (covered with grating) to maintain adequate street drainage.



Figure 4.29. Example of a pedestrian bulbout

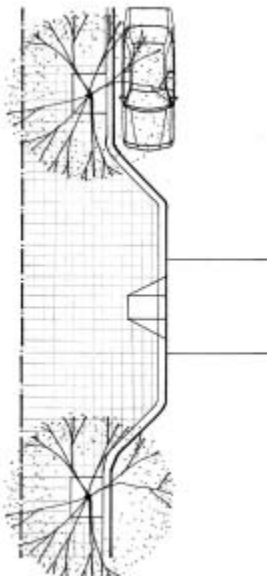


Figure 4.30. A midblock crosswalk



Figure 4.31. A midblock crossing would better connect this park with the library across the street

2. Where used, sidewalk bulb-outs should extend into the street for the width of a parking lane (a minimum five feet) in order to provide for a shorter crossing width, increased pedestrian visibility, more space for pedestrian queuing, and a place for sidewalk amenities and planting.
3. Curb extensions should be used on midblock crossing where feasible.
4. Curb extensions may be inappropriate for use on corners where frequent right turns are made by trucks or buses.

F. Installation of Midblock Crosswalks

Issues to Consider

- ◆ Midblock crosswalks provide convenient crossing locations for pedestrians when other crossing opportunities are distant, or where there is a presence of concentrated midblock pedestrian crossing demand.
- ◆ As may be the case for crosswalks at intersections, midblock crosswalks help to concentrate pedestrian crossing activity and alert drivers to the possible presence of pedestrians.
- ◆ Safety concerns arise at midblock crosswalks, as drivers typically do not anticipate pedestrians or crosswalks at non-intersection locations.

Guidelines

1. Crossing opportunities should be provided at midblock crossings where block lengths are greater than 450 to 550 feet in length and where there is a demand to cross. This will decrease the temptation, and sometimes necessity, to jaywalk. Prior to installing midblock crossings, consideration must be given to the following: sight distance, vehicle speed, accident records, illumination, traffic volumes, nearby pedestrian trip generators, distance to next crossing, etc. Midblock crossings may not be appropriate for arterials with speeds greater than 40 mph and traffic volumes higher than 20,000 vehicles per day, but better suited for streets with speeds less than 35 mph. Although there are instances where midblock crossing are indicated. There are several measures which could be used to provide acceptable crossing opportunities.
2. The distance to an adjacent marked crossing should be greater than 250 feet.
3. An engineering survey should be conducted to ensure that the number of midblock crossings would be high enough to justify installation.

4. A land use that generates high pedestrian volumes, such as a major office building, school, shopping area, or major transit stop, should be nearby.
5. Midblock crosswalks should be highly visible to motorists through the use of striping or textured pavements, or through the use of devices such as in-pavement crosswalk lights.
6. Additional measures such as neckdowns, raised crosswalks, in-pavement lighting or other appropriate measures should be considered with midblock crosswalks in order to further increase their visibility.

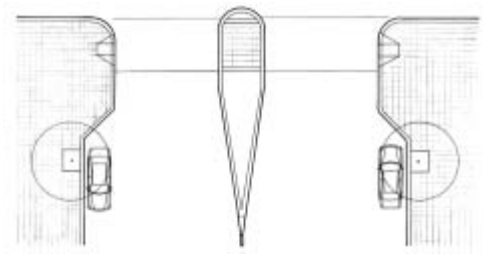


Figure 4.32. Pedestrian refuge island at an intersection

G. Pedestrian Refuge Islands

Pedestrian refuges in wide or busy streets improve safety for pedestrians and vehicles. They are defined as areas within an intersection or between lanes of traffic where pedestrians may safely wait until vehicular traffic clears, allowing them to cross a street. These islands are particularly helpful for seniors, the disabled, and children who may be unable to cross the street during the available signal time. Another benefit to pedestrians is that it can significantly reduce delay in crossing unsignalized intersections since the pedestrian need only search for vehicles in one direction at a time.

Pedestrian “corrals” (see Figure 4.32) can be located in islands to improve safety by forcing the pedestrian to look into the direction of oncoming traffic. Refuges can take on several different forms:

- **Center Median Islands** where possible, center medians should provide a waiting area for pedestrians waiting to cross the second half of the street.
- **Right-turn Channel Islands** where traffic is allowed a free right-turn at intersections, islands should be provided for pedestrians waiting to cross. However, right-turn channels should be discouraged as these devices typically allow cars to merely yield as they turn. Drivers thus need not take their time to thoroughly watch for pedestrians while making the turn.
- **Side Access Lane medians** where side access lanes (boulevards) are constructed, a waiting area should be provided on the median.

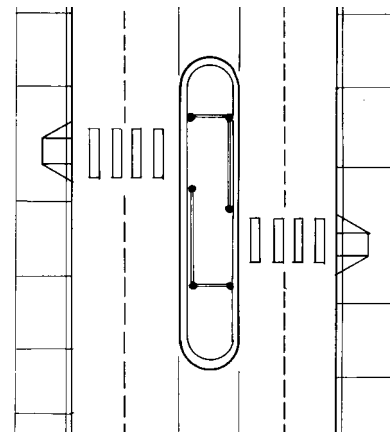


Figure 4.33. Midblock, “corral-style” pedestrian crossing and island

Issues to Consider

General

- ◆ Pedestrian refuge islands work well on wider streets where there are long pedestrian crossing times and exposure to vehicular traffic or on streets with speeds higher than 30 mph.



Figure 4.34. A lost opportunity for a pedestrian refuge island



Figure 4.35. A well-designed refuge island

ADA Accessibility

- ◆ Particularly useful for slower pedestrians such as the very young, elderly, or those with mobility disabilities.
- ◆ Where it is not possible to include ramps and waiting pads that meet ADA requirements, waiting areas should be at-grade with the roadway (channels), although slopes should facilitate drainage, and planting or bollards should buffer pedestrians from moving traffic.

New Development vs. Retrofit

- ◆ Pedestrian islands may be installed at intersections or midblock locations deemed appropriate through engineering studies.
- ◆ Pedestrian islands should be considered from the outset of design for intersections that are either complex, irregular in shape, excessively wide or in areas where children and older people are expected to cross frequently.

Relation to Transit

- ◆ The use of pedestrian islands should be considered where transit is “running” within the street right-of-way, particularly in station areas.

Guidelines

1. Pedestrian refuge islands should be installed at crossings of streets with 4 or more lanes, where a demonstrated crossing demand exists, and where it is feasible to provide a refuge island.
2. Pedestrian refuge islands should be installed at crossings of streets with two to three lanes, with traffic volumes higher 7,500 vehicles per day, and speeds greater than 35 mph, and where it is feasible to provide.
3. At street crossing locations with vehicle speeds higher than 35 mph and traffic volumes more than 15,000 vpd, “corral-style” pedestrian refuge islands should be offset so that pedestrians must face opposing traffic before crossing the second half of the street as illustrated in Figure 4.33.
4. Refuge islands should be a minimum of four feet wide by eight feet long. Offset refuge islands may require additional space.
5. Pedestrian refuge islands should be well illuminated. See section 4.5.3. Lighting.
6. Some type of vertical element should be provided on the island including trees, bollards, landscape features, or sign posts.

H. Sidewalks for Overpasses, Underpasses, and Highway On/Off Ramps

The conflict between the pedestrian realm and the auto realm is nowhere more apparent than at the intersections with the highway or freeway. Access across the roadway is often along a narrow sidewalk where the pedestrian is against a wall or guardrail and is highly exposed and vulnerable to speeding traffic. The unappealing environment of underpasses is often exacerbated by poor lighting and obscured sightlines. Pedestrian access across on- and off-ramps can also be harrowing since the driver is preoccupied with making the transition between the highway and the street network.

The overpass discussion is applicable to all bridges with pedestrian access, and the overpass and underpass discussions are applicable to grade separated rail road crossings.

Overpasses and Underpasses

Issues to Consider

General

- ◆ Overpasses necessitate accessible ramps that require considerable amount of additional land for installation.

New Development vs. Retrofit

- ◆ Opportunities to widen sidewalks when retrofits occur.

Guidelines

1. Over and underpasses should be considered only for crossing arterials with greater than 20,000 vehicle trips per day and speeds 35 - 40 mph and over.
2. Minimum widths for over and underpasses should follow the guidelines for sidewalk width (without on-street parking).
3. Underpasses should have a daytime illuminance minimum of 10 fc achievable through artificial and/or natural light provided through an open gap to sky between the two sets of highway lanes, and a night time level of 4 fc.
4. In underpasses, where vertical clearance allows, the pedestrian walkway should be separated from the roadway by more than a standard curb height.
5. Consider acoustics measures within underpasses to reduce noise impacts to pedestrians and bicyclists.



Figure 4.36. An unpleasant pedestrian environment beneath an overpass



Figure 4.37 and 4.38. Overpasses should safely accommodate all types of pedestrians.

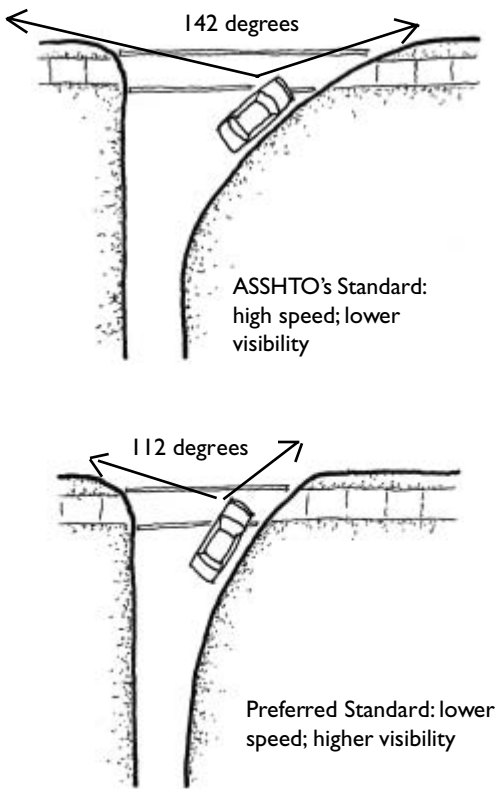


Figure 4.39. Tighter turning radii at a freeway off-ramp's right-turn slip reduces driver speed and requires less head-turning.

Highway On/Off Ramps

Issues to Consider

General

- ◆ Pedestrian safety is compromised where drivers are in the process of "transitioning" from high-speed highways to local streets.

ADA Accessibility

- ◆ Narrowing the crossing distance and/or providing a refuge island is necessary to reduce the time the slower moving disabled pedestrian is exposed.

New Development vs. Retrofit

- ◆ Many existing highway access points have been designed with limited provision for pedestrian access along the local streets, and the resulting situations often leave little space for retrofit.
- ◆ New highway access improvements such as reducing the turning radii need to be considered to address pedestrian and bicycle safety and access issues.

Guidelines

1. Free flowing entrance and exit ramps should not be constructed in areas where pedestrians are expected.
2. A right angle intersection should be provided where the ramp meets the cross street to improve visibility for both the motorist and pedestrians; as well as reduce the crossing distance.
3. The use of stop or yield signs or crossing signals should be considered to allow pedestrians the opportunity to cross.
4. Exits should be designed for 20 mph at the ramp-street intersections in urban areas, and pedestrian supportive areas.
5. Where merging ramps intersect with the local street, accessible channelization islands should be installed between the right and left turning movements to provide a crossing island for pedestrians.

Table 4.3. Pedestrian Crossing Prototypes





Location	Setting	Features
Kirkland, Washington 	<ul style="list-style-type: none"> • On Major Arterial between Freeway and Downtown • Unsignalized Intersection • High Speeds (40+ mph) • Near Park and Transit Stop • Moderate to High Traffic Volumes • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Overhead Illuminated Sign • Refuge Island • Pedestrian Crossing Signs on Curb, Median, and Overhead
Petaluma, California 	<ul style="list-style-type: none"> • Downtown Commercial Core • Four-Lane Main Street • 25 mph Speeds • Adjacent to Public Plaza and Parking Lot • Moderate Traffic Volumes • High Pedestrian Activity 	<ul style="list-style-type: none"> • Midblock Crosswalk • In-Pavement Crosswalk Lights (Passive Detection) • Curb Extensions with Landscaping • Special Crosswalk Striping • Advance Stop Bars
Annapolis, Maryland 	<ul style="list-style-type: none"> • Approach to Roundabout • 20-25 mph Speeds • Moderate Traffic Volumes • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Colored Pavement at Crossings • Pedestrian Crossing Sign at Crosswalk • Roundabout Splitter Island Provides Pedestrian Refuge • Ladder Crosswalk Striping
San Luis Obispo, California 	<ul style="list-style-type: none"> • In Urban/Rural Transition Area • Two-Lane Minor Arterial • Moderate Traffic Volumes • Moderate Speeds (35-40 mph) • Low to Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Staggered Crosswalk • Refuge Island, Similar to Pedestrian Corral but with No Fence • Pedestrian Crossing Signs on Curb and Median • Ladder Crosswalk Striping

Table 4.3. Pedestrian Crossing Prototypes (continued)

Location	Setting	Features
<p>Bellevue, Washington</p> 	<ul style="list-style-type: none"> • Adjacent to Major Transit Stop • High-Speed Corridor (45 mph) • Four-Lane Arterial • Traffic Volumes greater than 25,000 vehicles per day 	<ul style="list-style-type: none"> • Staggered Crosswalk • Median with Pedestrian Corral • Overhead Signs and Flashing Beacons • Advance Stop Bars • Ladder Crosswalk Striping
<p>Solana Beach, California</p> 	<ul style="list-style-type: none"> • Commercial Corridor • Two-Lane Street • 25 mph speeds • Moderate Traffic Volumes • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Midblock Crossing • Raised Crosswalk • Curb Extensions with Trees • Pedestrian-Scale Lighting • Special Crosswalk Striping • High-Intensity Yellow-Green Sign Color
<p>Berkeley, California</p> 	<ul style="list-style-type: none"> • Commercial District • Four-Lane Street • 25 mph speeds • High Traffic Volumes • High Pedestrian Activity 	<ul style="list-style-type: none"> • Midblock Crossing • Curb Extensions • Pedestrian Refuge Island • Special Crosswalk Striping
<p>Cotati, California</p> 	<ul style="list-style-type: none"> • Between Commercial District and City Park • Two-Lane Regional Street • 25 mph speeds • Adjacent to Transit Stop • Moderate Traffic Volumes • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Curb Extensions with Landscaping • Pedestrian-Scale Lighting • Colored Pavement at Crossing • Incorporated with Traffic Calming Elements • Street-narrowing edgelines • Center median

Table 4.3. Pedestrian Crossing Prototypes (continued)





Location	Setting	Features
Santa Rosa, California 	<ul style="list-style-type: none"> • Adjacent to Junior College and Commercial Areas • Four-Lane Major Arterial • Moderate to High Traffic Volumes • Moderate Speeds (35 mph) • Significant Pedestrian Activity 	<ul style="list-style-type: none"> • Overhead LED Flashing Pedestrian Crossing Sign • Flashing Beacons on Sides of Street • System is Activated by Pedestrian Push Buttons • Voice Alerts Pedestrians when System Has Been Activated • Yellow School-Area Zebra Striped Crossing
Portland, Oregon 	<ul style="list-style-type: none"> • Within Neighborhood Commercial Areas • Two-Lane Street • Moderate Traffic Volumes • Low Speeds (25 mph) • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Midblock Crossing • Curb Extensions • Pedestrian Refuge within Landscaped Median • Piano-Type Crosswalk Striping (high visibility, lower maintenance)
Mercer Island, Washington 	<ul style="list-style-type: none"> • Downtown Commercial District • Two-Lane Main Street • Low Traffic Volumes • Low Speeds • Moderate Pedestrian Activity 	<ul style="list-style-type: none"> • Intermittent Unmarked Midblock Crossings • Refuge Islands Created by Breaks in Landscaped Median • Curb Extensions in Parking Lane at Crossing Points • Pedestrian Scale Lighting
San Luis Obispo, California 	<ul style="list-style-type: none"> • Adjacent to School • Street Runs Between School and Drop-Off Area • Low Traffic Volumes • Low Speeds • Short Periods of Heavy Pedestrian Activity 	<ul style="list-style-type: none"> • Midblock Crossing with Pedestrian Refuge • Raised Crosswalk • Special Crosswalk Striping • High-Intensity Yellow-Green School Crossing Sign



Figure 4.40. A neighborhood choker and signage indicates entry into a traffic-calmed neighborhood.



Figure 4.41. A diagonal diverter maintains pedestrian connectivity but diverts auto traffic.



Figure 4.42. A pedestrian refuge island makes street crossing easier and effectively narrows the roadway and slows traffic.

4.4.4 Traffic Calming

Section 3.7.3 in the previous chapter discusses developing a traffic management plan that takes into consideration the safety and needs of pedestrians. Beyond education and enforcement and standard traffic engineering design techniques, physical interventions into the roadway may be necessary to mitigate traffic speed and increase driver awareness of the pedestrian. This section discusses a variety of measures that can be implemented to calm traffic, creating a street environment that is safer for everyone. Traffic calming techniques can achieve "pedestrian equivalence" by:

- ◆ reducing the number of accidents involving pedestrians;
- ◆ reducing the severity of all accidents;
- ◆ giving more space and priority to cyclists and pedestrians;
- ◆ slowing traffic volumes to less than 25 mph for residential streets and less than 30 mph for commercial streets and diverting traffic volumes in residential areas to achieve volumes less than 1,500 vehicles per day;
- ◆ separating pedestrian pathways from vehicle traffic; and,
- ◆ encouraging better driver discipline.

Common Traffic Calming Measures

Table 4.4 illustrates traffic calming measures focusing on those which contribute towards a more favorable pedestrian environment. Several of these, such as pedestrian bulb-outs and pedestrian refuge islands, have already been discussed. Reference should be made back to Table 4.1 in Section 4.4.1 for matching each measure with road type.

Issues to Consider

ADA Accessibility

- ◆ Traffic calming features must take all aspects of ADA into consideration, as the resulting streets and pedestrian circulation may not be "typical," which can make them particularly confusing to those with visual impairments.

Relation to Current Standards and Practices

- ◆ The use of traffic calming features has been very common in the traffic engineering community. Although initially focused more on residential neighborhoods, use of these techniques is expanding more to arterial and collector streets where pedestrian travel is common.

Guidelines

For a traffic-calming strategy to be most effective, the following should be implemented:

- Prior to implementing traffic-calming, effort must be spent on establishing neighborhood consensus to ensure an equitable strategy that does not provide benefits for some residents at the expense of others.
- The initial change to be made in areas where a safer pedestrian environment is desired is to narrow the width of the street given over to automobiles. In pedestrian-dominated areas the recommended maximum travel lanes width is ten feet six inches.
- Where speeds of less than 25 mph are desired, such as within residential neighborhoods, traffic calming features may need to be continuous (in the case of landscaping or narrowed lanes) or positioned as close as every 200-300 feet (in the case of speed undulations or horizontal deflections) in order to deter unnecessary acceleration and braking.
- Signage should be used to remind drivers that they are entering a traffic-calming zone and an overall posted low speed limit should be maintained in residential areas.
- Traffic-calmed areas should be well-lit to further the effectiveness of the measures used.
- Traffic calming features should be integrated with aesthetic improvements, such as landscaping, that will make the street more attractive and be more inviting for pedestrians and cyclists.



Figures 4.43 and 4.44. Traffic calming circles slows vehicles at intersections and provides opportunities for special landscaping.

Table 4.4. Traffic Calming Measures

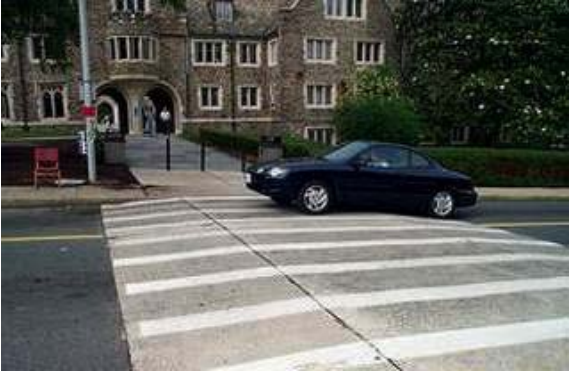



Type	<i>Speed Tables and Raised Intersections</i>	<i>Sidewalk Bulbouts</i>
Description and Application	<p>Promotes smooth flow of traffic at slow speeds at interfaces with pedestrian zones or crossings. Raises the surface of the road over a short distance, generally to the height of the adjacent curb. Useful in central business district in high pedestrian areas or at interfaces between arterial and entrance to a pedestrian supportive area, such as a CBD, mixed-use centers or residential neighborhoods.</p>	<p>Sidewalks are brought out to narrow the drive lanes and reduce the radius of corners at intersections. Narrowing the street also reduces pedestrian crossing distances. For more detail, refer to Section 4.4.3, Pedestrian Crossings for further discussion about bulbouts.</p> <p>"Chokers" are used along at the entry point to residential streets from busier collectors or arterials. They signal to the driver that there is a clear transition and that a reduction in speed is necessary.</p>
Example Configuration	 <p>Example of a Raised speed table.</p> <p>Construction note: The most common type of speed table is three to four inches high and 22 feet long in the direction of travel, with six-foot ramps at the ends and a 10-foot field on top. This design generally produces an 85th percentile speed of 25 to 30 mph. Although by varying dimensions, a desired target speed can be achieved for a given application.</p>  <p>Detail of potential drainage solution</p>	 <p>Example of a pedestrian bulbout combined with a raised speed table</p>  <p>Example of neighborhood gateway "choker".</p>

Table 4.4. Traffic Calming Measures (continued)

Type	<i>Pedestrian Refuge Median Islands</i>	<i>Traffic Calming Circles</i>
Description and Application	<p>Pedestrian refuges in wide or busy streets improve safety for pedestrians and vehicles. They are defined as areas within an intersection or between lanes of traffic where pedestrians may safely wait until vehicular traffic clears, allowing them to cross a street. These islands are particularly helpful for older and disabled pedestrians unable to cross the street during the available signal time. Many existing streets with medians do not include pedestrian refuge areas. Providing refuges should be considered as an important part of future retrofit projects. See Section 4.4.3 for additional discussion.</p>	<p>Traffic calming circles as defined in these guidelines are generally between 10 and 20 feet in diameter located at street intersections, and are used to slow traffic at intersections. The circles have a raised curb edge and landscaping within them providing visual interest and reducing the length of vistas down streets which can also help to slow traffic.</p>
Example Configuration	<div data-bbox="272 905 808 1276"> </div> <p data-bbox="272 1283 808 1318">Example of a “zig-zag” refuge island</p> <div data-bbox="277 1346 803 1864"> </div> <p data-bbox="272 1871 808 1934">An effective refuge island in Solana Beach with a 48” accessible curb-cut.</p>	<div data-bbox="885 884 1458 1283"> </div> <p data-bbox="873 1289 1474 1352">A traffic calming circle in a Portland neighborhood with detail of edge.</p> <div data-bbox="976 1373 1333 1759"> </div> <div data-bbox="992 1766 1187 1885"> <p>Legend:</p> <ul style="list-style-type: none"> A Street Width B Curb Return Radius C Off-Set Distance D Circle Diameter E Opening Width </div> <p data-bbox="889 1892 1338 1955">Diagram adapted from the City of Seattle Engineering Department.</p>

Table 4.4.Traffic Calming Measures (continued)



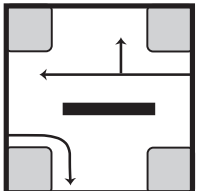
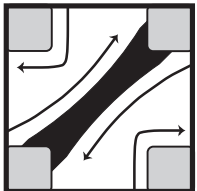
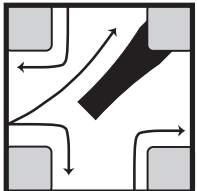
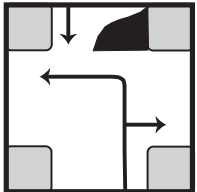
Type	Roundabouts	Traffic Diverters
Description and Application	<p>Roundabouts are circular intersections that are used to slow traffic, maintain adequate capacity and provide for safer pedestrian crossings at intersections.A raised curb edge and landscaping would be provided in the center with a "truck apron" for large vehicles. Roundabouts also provide visual interest, reducing the length of vistas down streets and providing a gateway element which can also help to slow traffic.</p> <p>In order to address guidance for the sight impaired at a roundabout, tactile strips have been used to guide these users to the pedestrian crossing locations and at each point where there are entry points into and out of the crosswalk.</p>	<p>While well-designed traffic diverters do not impact pedestrian and bicycle connectivity they do disconnect the street system for automobiles often funneling traffic and creating busier streets in those locations. For this reason their use should be minimized.</p>
Example Configuration	<div><p>Roundabout</p></div> <div><p>Roundabout at Otay Ranch.</p></div>	<div><p>Channelization diverter</p></div> <div><p>Diagonal Diverter</p></div> <div><p>Truncated Diagonal Diverter</p></div> <div><p>Curb Diverter</p></div>

Table 4.4. Traffic Calming Measures (continued)

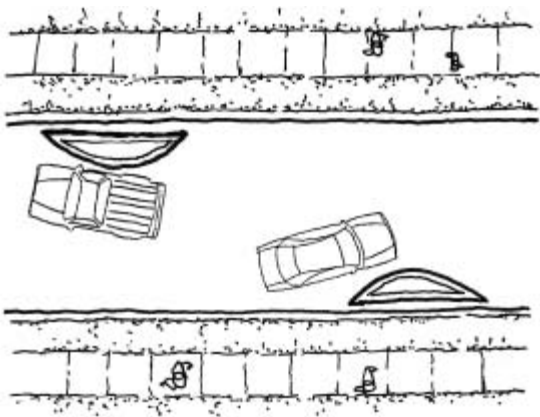

Type	<i>Chicanes</i>	<i>On-Street Parking</i>
Description and Application	<p>Chicanes are curb bulb-outs offset from each other in midblock locations to reduce traffic speeds and improve safety. Chicanes can have a negative effect on bicycle access, which must be taken into consideration when decisions are made about their use.</p>	<p>The provision of on-street parking has been shown to help moderate traffic speeds, particularly when vehicle travel lanes are not excessively wide. Pedestrians also tend to feel safer walking on sidewalks adjacent to parked vehicles, as the solid buffer created between the sidewalks and moving traffic on the street provides a sense of security. Where possible, it is also desirable to have additional clearance between the edge of curb and primary sidewalk area to accommodate car doors opening and closing.</p>
Example Configuration		



Figure 4.45. Excessive curb cuts and driveways erode the pedestrian environment.

4.4.5 Site Access Controls

Beyond crossing a street, conflict points between autos and pedestrians occur at curb cuts where autos cross pedestrian paths. Auto-oriented uses, such as filling stations often have curb cuts along most of their street frontage (for convenience to the auto) and create a very unfriendly environment for pedestrians. Site access control refers to implementing restrictions on the extent and location of curb cuts so as to minimize conflicts with pedestrian routes.

Issues to Consider

General

- ◆ Amongst adjacent properties there is the opportunity to reduce curb cuts and reduce overall parking requirements by interconnecting parking lots and sharing parking between uses.
- ◆ A street serves two purposes: moving traffic through a neighborhood and providing access to local destinations. It is possible within a wide right-of-way (i.e., greater than 100 feet) to separate the two uses by the creation of side access lanes that are separated from the central, through-traffic lanes by medians. The side access lanes that are generally 10 to 11 feet wide accommodate slow moving autos and on-street parking. Adjacent sidewalks therefore are considerably more pedestrian-friendly.

ADA Accessibility

- ◆ Multiple curb cuts can have a “roller coaster” effects on sidewalks and be difficult to navigate.

New Development vs. Retrofit

- ◆ Negotiation required with existing businesses and property owners to retrofit.

Relation to Transit

- ◆ Reducing the number and length of curb cuts can create more space for transit facilities along existing streets.

Guidelines

1. Curb cuts for two-way traffic should not be wider than 24 feet, with an exception for curb cuts that provide frequent access for semi-trucks in which case they should not be wider than 30 feet.
2. In nonresidential pedestrian supportive areas, there should be no more than one curb cut per 200 linear feet of street frontage.

3. Parking lots in adjacent properties should be interconnected whenever possible to reduce the number of curb cuts.
4. A boulevard configuration that separates through-traffic from local traffic should be considered on arterial streets with a large amount of through-traffic and local traffic, or uses that front directly onto the street, thereby allowing the pedestrian to walk adjacent to slower moving traffic.
5. A 4 foot minimum width of sidewalk with no more than a 2% cross slope should be provided across all curb cut access points. (See Section 4.5.1 for more information on sidewalk design)

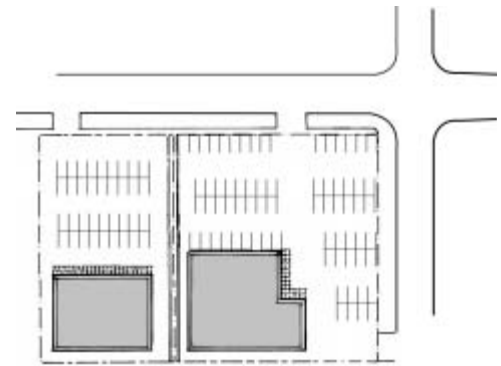


Figure 4.46. Conventional parking and access configuration

4.4.6 Street Parking

On-street parking provides more activity on the street, supports adjacent commercial uses, provides a buffer for pedestrians between the sidewalk and moving traffic, and serves to calm traffic. Furthermore, on-street parking maximizes the availability of parking, thus minimizing the need for off-street parking. The buffering effect between the moving traffic and the sidewalk provides pedestrians a sense of safety as they stroll, shop, and converse on the sidewalk.

Issues to Consider

General

- ◆ On-street parking increases parking availability near a driver's destination.
- ◆ On-street parking visually narrows the street, signaling to the drivers to slow down and provides a protective barrier between through-traffic and pedestrians.
- ◆ Look for opportunities to provide diagonal parking where parking demand is higher.
- ◆ Give consideration to potential conflicts with bicyclists.

ADA Accessibility

- ◆ Visibility concerns for people sitting in wheelchairs.

New Development vs. Retrofit

- ◆ If traffic levels allow, then simply allowing on-street parking may vastly improve the pedestrian realm.

Relation to Current Standards and Practices

- ◆ Most existing ordinances do not allow counting of on-street parking towards parking requirements.
- ◆ The manual on Uniform Traffic Control Devices (MUTCD) recommends prohibiting parking within 100 feet on the

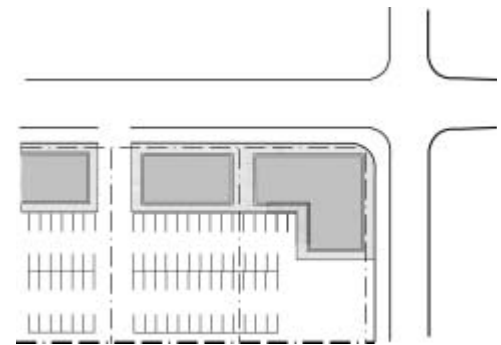


Figure 4.47. Preferred parking and access configuration with fewer access points and connection between parking lots

approach to a signalized midblock crossing, and 20 feet beyond. This can significantly reduce the availability of on-street parking in busy commercial areas. Such areas generally have slower moving vehicles (typically less than 30 mph) and therefore an optimal balance must be determined between serving adjacent land uses and serving the pedestrian.

Guidelines

1. On-street parking should be maximized in all districts.
2. On-street parking should be counted towards requirements for adjacent uses.
3. Stall lengths should not exceed 22 feet.
4. Tree wells placed within the parking lane every two to three spaces may be used to visually narrow the width of a street. Tree well spacing should not exceed 2 spaces where street trees are not present along adjacent sidewalks, and three spaces where the adjacent sidewalk is lined with trees.
5. In pedestrian supportive areas, parking can be utilized most efficiently by using "parking districts" to establish the overall parking needs for the area. This allows on-street parking to be easily counted towards the area's parking requirement.
6. Communities should consider implementing "back in" diagonal parking where the driver has better visibility to the street when pulling out of the parking space.
7. Unused parking areas should be removed and replaced with either landscaping or pedestrian walkways.

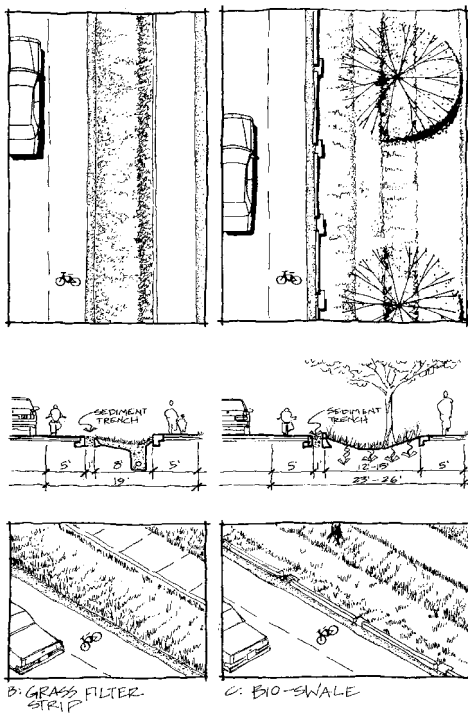


Figure 4.48. Pedestrian access integrated into a "Green Streets" strategy

4.4.7 Stormwater Management Facilities - "Green Streets"

Stormwater management facilities such as biofiltering swales (a natural or man-made vegetated shallow ditch that intermittently contains or conveys runoff) and linear detention basins located within the right-of-way are emerging as cost-effective and sustainable solutions for the treatment of polluted runoff from roadways. As such, they may soon have a presence in the roadways of the San Diego Region and planning for them from a pedestrian point-of-view is therefore prudent.

Apart from water quality benefits these "Green Streets" solutions may be as benign as using street tree wells as miniature stormwater infiltration basins (also referred to as "bio-retention cells") or as prominent as vegetative swales within roadway medians. Either way these facilities have an opportunity to vastly improve the pedestrian realm by providing increased opportunities for landscaping, improved roadway aesthetics and inevitably traffic-calming.

4.5 Creating a Pedestrian Realm

Safe and direct sidewalk connections are of key importance to creating a pedestrian-friendly environment. Sidewalks should support activities that will occur in the area and provide a comfortable place for pedestrians to take part in various activities. But creating a high quality pedestrian realm that supports and encourages walking takes much more than simply providing sidewalks.

The design of the sidewalk and the elements within it and the location and design of buildings are just some of the additional considerations of creating a pedestrian-supportive environment. Furthermore, walking provides more opportunities to notice details than any other form of transport. Landscape and architectural details are therefore necessary to sustain interest for the pedestrian as well as provide a safe and comfortable experience.



Figure 4.49. The pedestrian realm; Paris (Allan B. Jacobs, *Great Streets*)

4.5.1 Sidewalk Design

Sidewalks are not just thoroughfares for pedestrians but they are also important social spaces where people interact and walk together, catch a bus, window shop, or have a cup of coffee at a cafe. The sidewalk must be wide enough to accommodate movement as well as amenities such as seating that facilitate social interaction. This makes the sidewalk more comfortable and appealing which can encourage uses that increase security.

The Table 4.5 at the end of the section illustrate typical sidewalk sections.

Issues to Consider

General

- ◆ Existing excessive right-of-way widths also allow for widening sidewalks and on-street parking, both of which significantly improve the pedestrian experience.
- ◆ Increased buffering between fast-moving traffic and abutting properties created by wider sidewalks or local access lanes makes the street more attractive for buildings to front directly onto the street.
- ◆ Provide appropriate sidewalk width given the use and amount of activity that is expected.
- ◆ Select materials with consideration towards maintenance and long-term appearance.
- ◆ Minimize obstructions and conflict points.

ADA Accessibility

- ◆ All sidewalks must be ADA compliant in dimension,



Figure 4.50. Sidewalks must be wide enough to safely and comfortably accommodate the pedestrian.



Figure 4.51.A “well-zoned” sidewalk

surfacing and grading (except in extreme topographical conditions).

New Development vs. Retrofit

- ◆ Dimensions of an existing sidewalk can be increased through either the acquisition of additional right-of-way, zoning a setback requirement for new development to create additional pedestrian space, or through a reduction in curb-to-curb roadway width. Curb-to-curb roadway width can be reduced when traffic volumes are less than 12,000 to 15,000 vehicles per day by restriping a road from a four-lane roadway to a two or three lane roadway. Also, if travel lanes are more than 12 feet, the road width can be reduced to create 12 foot lanes, and in some cases as narrow as ten feet. Another alternative to reducing roadway width in these cases could be to revise the parking from parallel to diagonal which would slow speeds and create a more acceptable pedestrian environment.
- ◆ New streets must balance the needs of all users in determining right-of-way width.

Relation to Current Standards and Practices

- ◆ Effective sidewalk dimensions need to be written into local municipalities' street design guidelines, building codes, and zoning ordinances.
- ◆ The Cities of San Diego and Carlsbad are in the process of adopting street design standards that require a well designed sidewalk and pedestrian realm.

Relation to Transit

- ◆ The "footprint" of and access to transit facilities such as bus shelters, must be considered in the design of sidewalks.
- ◆ Sidewalks must connect transit facilities with the adjacent uses within walking distance of the station or bus stop.
- ◆ Review the design standards and guidelines of your local transit provider as well as these guidelines in relation to pedestrian access to transit facilities.

A. Locating a Sidewalk

It is desirable in most cases that a sidewalk be located on both sides of the street (or in rural situations, a widened shoulder). Where this does not occur there is a discontinuity in the pedestrian realm which forces pedestrians to unnecessarily cross a street in order to reach their destination. In a constrained right-of-way situation it may be necessary to limit a sidewalk to one side, which is better than providing no sidewalk at all. In doing so however, consideration must be given to the demand on the right-of-way by all users.

B. Determining a Width - Establishing "Zones"

The Sidewalk Corridor is typically located within the street right-of-way between the curb and building face and/or property line. The sidewalk corridor is composed of four distinct zones: the Edge Zone, the Furnishing Zone, the Throughway Zone and the Frontage Zone.

Edge Zone

The Edge Zone (sometimes referred to as the "Curb Zone") is the interface between the roadway and the sidewalk. At a minimum this zone includes the 6" wide curb. In more active mixed-use areas with on-street parking this zone should be a minimum of 1'-6" to accommodate the door swing of a parked car to prevent conflict with elements within the Furnishing Zone. At transit stops with shelters, this zone should be widened to 4 feet to provide wheelchair access to the shelter (in constrained conditions, transit shelters are available with partially open sides allowing the edge zone to be reduced to 2'-6"). Providing a bulbout for the entire length of the transit stop is also an effective way to increase Edge Zone width.

Furnishings Zone

The Furnishing Zone also accommodates street trees and landscaping. It is the zone that provides the buffer between the active pedestrian walking area, the Throughway Zone, and street traffic. Street trees, tree lawns, street furniture, utility poles, phone booths, parking meters, fire hydrants, bicycle racks and the like are consolidated in this zone to keep them from being obstacles in the Throughway Zone. Planting in this zone must comply with the standards and guideline listed in Section 4.5.4 particularly in the case of street tree well dimensions.

Installing pedestrian bulb-outs (see Section 4.4.3) is an effective way to increase sidewalk space for street furniture and other features.

The dimension of the Furnishing Zones must consider whether street parking is provided (an effective buffer) and the speed of traffic. If, for instance, no on-street parking is provided and traffic speeds are 30 mph or less than the minimum zone, dimension should be five foot six inches. For speeds exceeding 30 mph, an additional one foot six inches should be added for every 10 mph increase in posted speed.

Throughway Zone

The Throughway Zone is intended for pedestrian travel only and should be entirely clear of obstacles, including driveway aprons. At an absolute minimum this zone must be at least 4 feet wide for streets with low pedestrian volume for ADA accessibility purposes (allowing opportunities to widen to 5 feet at least every 200 feet).

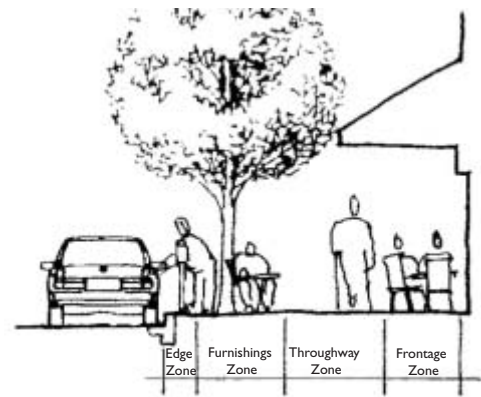


Figure 4.52. Pedestrian sidewalk zones



Figure 4.53. If outdoor seating is desired for restaurants and cafes in order to activate the street, guard rails can be used to separate the zones.



Figure 4.54. Accommodating elements such as transit shelters may require the throughway zone to be jogged.

For higher volume streets that have met minimum requirements for all other zones, the preferred dimension is 6 to 8 feet. For very high pedestrian volume areas, additional width should be provided. "Overhanging" elements such as awnings, store signage, bay windows, etc. may occupy this zone as long as there is a clear distance under them of at least 8 feet.

Frontage Zone

The Frontage Zone is the area adjacent to the property line that may be defined by a building façade, landscaping, or a fence. Generally pedestrians do not feel comfortable moving at a full pace directly along a wall, and because of this the minimum frontage zone should be 1'-6" in these situations. This is also the zone where pedestrians slow down and window shop, and exit and enter buildings. Adjacent businesses may use this zone for outdoor displays and seating, and municipalities must ensure that there is adequate space to accommodate these uses without impeding the Throughway Zone.

Architectural elements that encroach into the street such as awnings, stairs, front stoops, planters, marquees and the like may also occupy this zone. These elements add vitality and visual interest to the street, but also must comply with local building codes and zoning ordinances.

Where no Furnishings Zone exists, elements that would normally be sited there such as benches, light poles, signals, trash cans, etc. may occupy the Frontage Zone in order to keep the Throughway Zone clear and maintain at least minimum ADA requirements. If traffic signal and light poles are to be located in the Frontage Zone rather than immediately adjacent to the curb, these poles would require longer mastarms to project out into the street at the desired location.

Where the sidewalk passes a parking lot, there must be some type of buffer such as a hedge or a low wall that prevents parked vehicles from overhanging into the Frontage Zone and that maintains a more aesthetic frontage along the sidewalk.

C. Grades, Cross Slope, and Curb Cuts

Grades that exceed five percent (1:20) can be difficult to navigate for persons with mobility problems, and walkways should therefore be below this. For sidewalks adjacent to streets that exceed this grade, installing handrails should be considered.

The cross slope is the slope measured perpendicular to the direction of travel and is necessary for proper drainage. Sidewalks therefore should be designed with a 2 % (1:50) cross slope, but not greater, in order to maintain a relatively level surface for wheelchair and walker users.

Curb cuts exist where a driveway crosses the sidewalk. In addition to the potential conflict between driver and pedestrian at these locations there is also a concern in the design of the curb cut to minimize impact on mobility along the sidewalk. Figure 4.55, repeated from Section 4.2.2, illustrates the preferred condition where the Throughway Zone is maintained across the entire driveway. The sloped portion of the driveway is located entirely within the Furnishing Zone. The "look" of the sidewalk (i.e. scoring pattern) is also maintained to indicate that although a vehicle can cross, this remains a pedestrian area.

For constrained conditions, Figure 4.56 represent a "dropped driveway" solution that meets ADA requirements. Once again, the sidewalk pattern is maintained across the length of the driveway. An alternate approach to the constrained condition is to provide a bypass walk at the top of the driveway, but this requires the pedestrian to make a slight detour and should only be considered in situations with steep grades or drainage issues.

D. Surfacing

ADA requirements dictate that surfaces must be "stable, firm, and slip-resistant." Generally, sidewalks are constructed of Portland cement concrete (PCC) that is durable and meets ADA criteria. PCC can also be scored in a variety of patterns.

Asphaltic concrete pavement (ACP) is also an option in areas with low pedestrian volumes, but it is not as durable as PCC and tends to settle unevenly and should generally be avoided.

Unit pavers, bricks, and tiles add a special character to sidewalks when used as both the filed paving or as accents. Proper installation is the key to avoid unevenness. Care should also be taken to ensure that any special paving, particularly tile, is slip resistant.

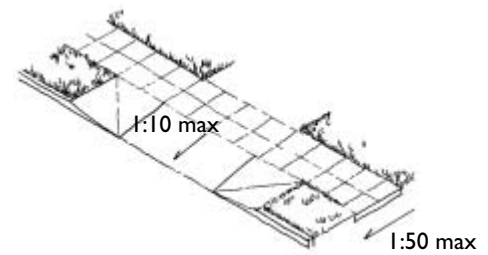


Figure 4.55. Preferred driveway condition

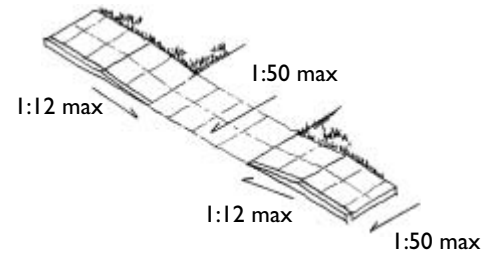


Figure 4.56. "Dropped driveway" for constrained width situations only



Figure 4.57. The use of tree grates is an effective way of using part of the furnishing zone for the throughway zone.

Guidelines

1. In commercial and mixed-use areas with storefronts close to the street the preferred width of a sidewalk is 13 to 16 feet. This allows for pedestrian circulation and window-shopping. The minimum possible width for new development should be ten feet. Widths over 13 feet provide space for pedestrian amenities, for local business activity to spill out onto the sidewalk, and for leisurely walking pace without vehicle traffic dominating the pedestrian realm.
2. In residential areas sidewalks should be at least five feet wide and be separated from the street by a planting strip with a minimum six foot width. Sidewalks in residential areas that may have more pedestrians, such as parks, schools, or neighborhood centers, may need wider sidewalks.
3. Sidewalks should be provided on both sides of the street; the only exception is in lower intensity residential neighborhoods where pedestrians can be safe walking in the street; or where existing constrained right-of-way does not allow for ADA accessible width on both sides of the street.
4. "Wandering" the sidewalk should be avoided. Pedestrians want to walk the shortest distance possible, and wandering the sidewalk can be disorienting for persons with visual impairments. Landscaping and other design treatments can achieve a more casual and rural atmosphere without requiring pedestrians to walk longer distances.
5. Pathways should be designed with materials that are stable, firm and slip-resistant; preferably Portland concrete cement (PCC).
6. The surface of the pathway should remain continuous even at driveways and maintain a continuous cross slope of no greater than two percent. This signals to the drivers that it is they who are crossing the pedestrian realm and must yield accordingly.
7. To avoid the possibility of cars parking on sidewalks and impeding the pedestrian, box curbs should be used instead of rolled curbs; in some cases, bollards may be needed.
8. General maintenance, such as fixing potholes, sidewalk decay, damaged benches and other pedestrian amenities should be conducted regularly. Physical safety is not only the issue but proper maintenance indicates a level of care which in turn improves a pedestrian's sense of security.

Table 4.5. Typical Sidewalk Sections

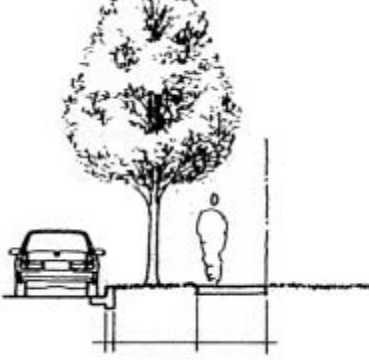
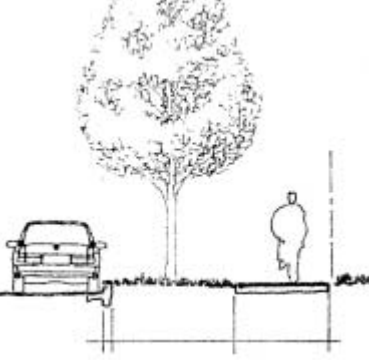

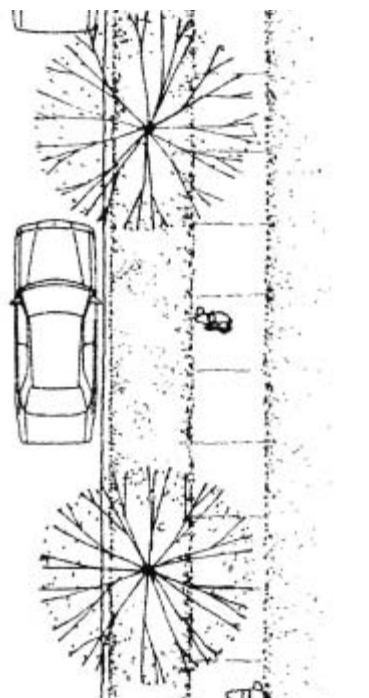
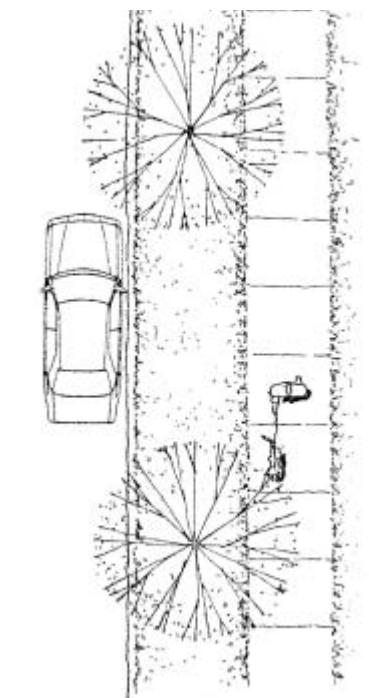
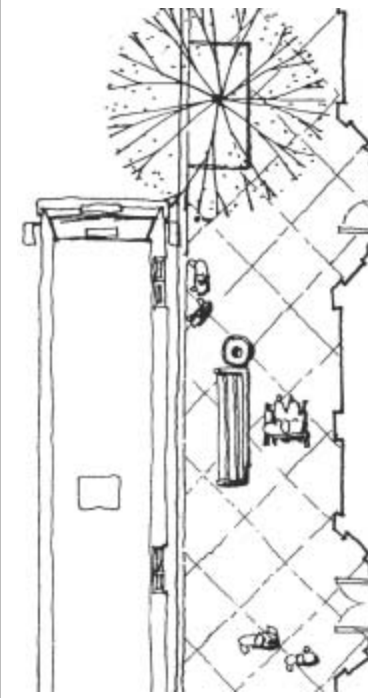
Type	11'6"				14'6"				10'			
	Residential Minimum				Residential Preferred				Low-Intensity, Mixed Use			
Application	Recommended along local residential streets with on-street parking where vehicular speeds are less than 30 mph.				Recommended along local residential streets with on-street parking where vehicular speeds are less than 30 mph.				Recommended for low-intensity, mixed-use streets with on-street parking At transit stops, sidewalk dimension allows only for bench (no shelter).			
												
Recommended Configuration	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone
	6"	6'	5'	0'	6"	8'	6'	0'	1'6"	3'	4'	1'6"
												

Table 4.5. Typical Sidewalk Sections (continued)



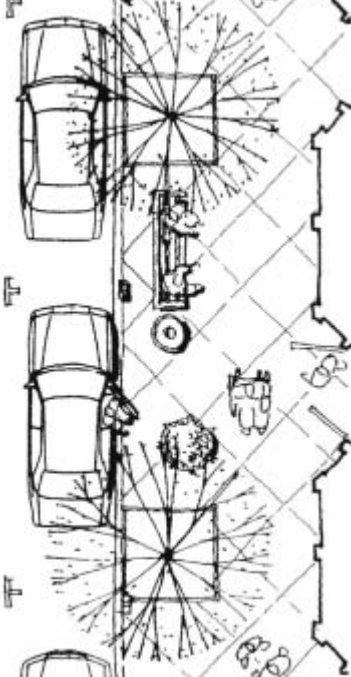
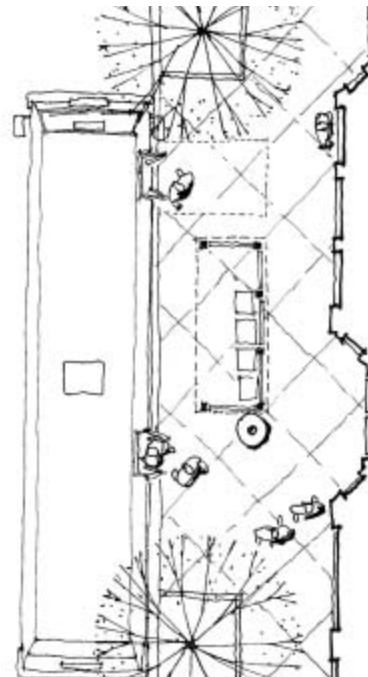
Type	13' Mixed Use				13' Mixed-Use at Transit Stop			
	Recommended for mixed use commercial areas where there is on-street parking and r.o.w. has 2 - 3 lanes of moderate activity.				Recommended for mixed use commercial areas where there is on-street parking and r.o.w. has 2 - 3 lanes of moderate activity.			
Application								
	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone
Recommended Configuration	1'6"	5'	5'	1'6"	4'	4'	5'	0'
								

Table 4.5. Typical Sidewalk Sections (continued)

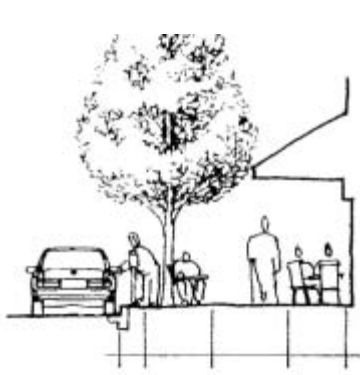
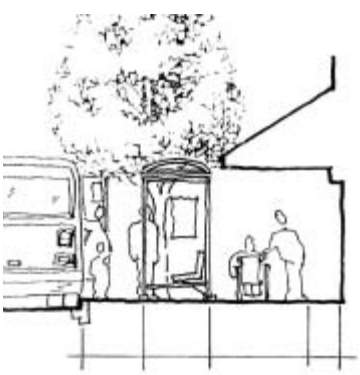
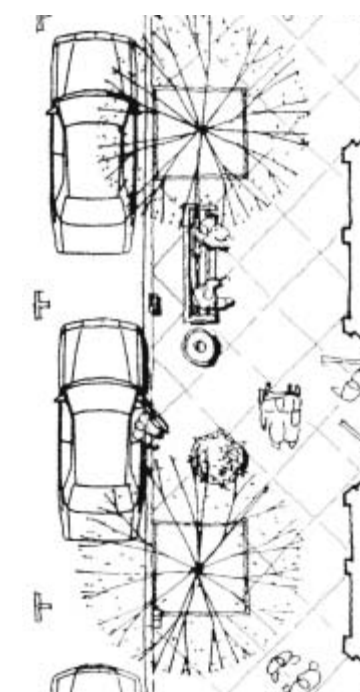
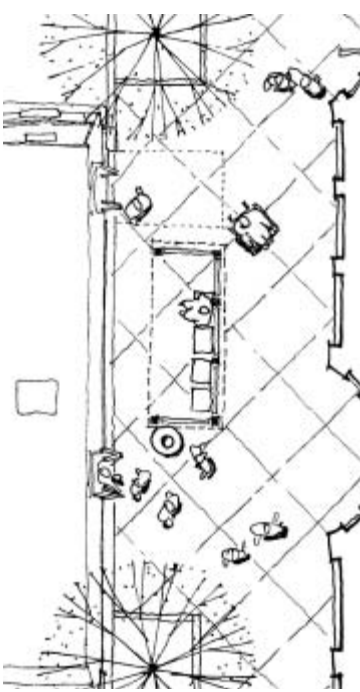

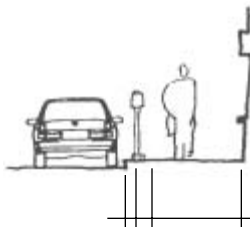
Type	16' Mixed Use Street				16' Mixed Use at Transit Stop			
	Application				Application			
Recommended Configuration	<p>Recommended for mixed use commercial areas where there is on-street parking and r.o.w. has 3 lanes of high activity or 4-5 lanes of low activity.</p>				<p>Recommended for mixed-use commercial areas where there is on-street parking and r.o.w. has 3 lanes of high activity or 4-5 lanes of low activity.</p>			
								
	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone
	1'6"	4'6"	6'	4'	4'	5'6"	5'	1'6"
								

Table 4.5. Typical Sidewalk Sections (continued)

Type	13' -15' Industrial or Arterial				10' +/- Rural				8'6" & less Constrained Mixed Use			
	Application				Application				Application			
Recommended Configuration	With on-street parking:				Roadway shoulder:							
	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone
	6"	5'6"	5'	2'	0'	0'	10'	0'	6"	4'	4'	0'
	Without on-street parking:				With swale separation:							
	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone	Edge Zone	Furnishings Zone	Throughway Zone	Frontage Zone
	6"	7'6"	5'	2'	0'	varies	8'	0'	6"	2'	5'6"	0'
										1'6"	5'	
										1'	4'6"	
										0'	5'	

4.5.2 Sidewalk Amenities/Seating

The placement of pedestrian amenities such as trash receptacles and benches should not be "regimented" (i.e. "placed every 40 feet" etc.), but rather have a relationship to the needs of a specific location. This is particularly important given that funds for installing and maintaining such amenities are generally limited. Locating amenities must take into account that use of a street changes over time and that the placement of trash cans, benches, telephones, drinking fountains, and vendors. Furthermore, street amenities and transit stops should uniquely reflect the local character of the surrounding neighborhood or district (i.e. industrial, traditional, contemporary), helping to achieve a sense of a community identity.

Public seating is a welcome relief for pedestrians. Seating invites people to stay on the street to rest, converse, wait, read, or just people-watch. They feel safer when they can see and be seen by other people. Creating places like these - places inviting for all - can dissuade nuisance activities by providing passive monitoring ("eyes on the street").

Issues to Consider

General

- ◆ Amenities are a necessary public expenditure.
- ◆ Amenities must fulfill an area's immediate needs but be flexible over time to address changing uses and needs.
- ◆ The design and materials of seating and other amenities should reflect the character of the surroundings.

ADA Accessibility

- ◆ The placement of street furniture should not impede the accessible travel path.
- ◆ Water fountains need to be accessible.
- ◆ Furniture placement should not be an obstacle to on-street parking access, especially when lift equipment and wheelchair movement are necessary.
- ◆ The visually impaired who rely on canes need an indication of an object as near to the surface of the walkway as possible.
- ◆ The upcoming update to national ADA standards may require the use of "accessible" benches in public places.

Relation to Transit

- ◆ Transit stops provide the opportunity for additional sidewalk amenities.



Figure 4.58. Example of a "well-furnished" sidewalk



Figure 4.59. A comfortable bench adjacent to a walkway



Figure 4.60. A consolidated newspaper rack



Figure 4.61. This bench is designed into a midblock bulbout and incorporates elements of public art



Figure 4.62. A chessboard as street furniture



Figure 4.63. Additional space is created for outdoor dining and landscape amenities by installing a midblock bulbout.

- ◆ Transit stop amenities should balance the need to identify with the transit system while complementing community identity.

Guidelines

1. Sidewalk amenities should be located within the Furnishings or Frontage Zones as described in Section 4.5.1.
2. When possible, seating arrangements should be configured to allow people to converse easily; i.e. face benches towards each other.
3. Seating should be provided adjacent to major destination points, such as department stores and restaurants, where they are often necessary and where they will not be underutilized or neglected.
4. Seating and other amenities should be made of durable, high-quality materials which visually reinforce community identity and the design of nearby buildings.
5. Seating may be incorporated as part of building form or landscape features, such as seat-walls as an option to free-standing benches.
6. Unfortunately, in some cases fear of loitering has resulted in seating that is so uncomfortable that no one would want to use it. Care should be taken in balancing concern of loitering with that of creating seating that is attractive and comfortable.
7. Pedestrian amenities may also be placed within bulb-outs where sidewalk widths are extended into the parking lane. These spaces may accommodate seating, planting, trash receptacles and other amenities where high foot traffic will not create conflicts. Dining areas for adjacent restaurants can be located on large bulb outs in order to minimize conflicts between high amounts of foot traffic at crossings and the privacy needed by diners.
8. Bulbouts may preclude fire vehicles from quickly negotiating turns. Where there is difficulty, the curb extension should be designed with a mountable or rolled curb, but still differentiated from the roadway with pavement color and texture or bollards. However, any bollards, poles or street furniture must be kept back from the large vehicle wheel tracking which may mount the curb.
9. Street furnishing design and location should consider car overhangs and door movement when placed near the curb and should be located at the ends of the on-street stalls rather than the center.

10. No sidewalk amenity should reduce the clear width of a sidewalk or walkway path to less than 4 feet.
11. To aid the visually disabled, use colors that contrast the color of sidewalks and the surroundings.
12. Design and location of streetscape amenities should comply with the requirements of ADA.

4.5.3 Lighting

Currently most of the streets in the San Diego region are dark, particularly along sidewalks. Good levels of lighting are important for maintaining a safe and secure pedestrian realm during the evening. The standard cobra head fixture serves the auto, but does not provide the lighting appropriate for pedestrians. Pedestrians have a smaller field of focus, when compared with people in a moving vehicle, since they move at a slower pace, look at more detail, and stop frequently for longer periods of time. Thus, they require shorter light standards to direct more intense light onto a smaller space.

Issues to Consider

General

- ◆ Provide adequate and aesthetically pleasing lighting for safety and security of all modes of transportation.
- ◆ Establish appropriate light levels.

ADA Accessibility

- ◆ Those who are visually impaired will find navigating a poorly lit sidewalk especially difficult; glare should be avoided as well.

Relation to Current Standards and Practices

- ◆ The desire for “dark skies” advocated by officials at Mount Palomar Observatory should be balanced with pedestrian safety. Establishing standards controlling stray up-lighting can accomplish this.
- ◆ Careful design and selection of lighting fixtures and luminaires will allow lighting levels while conserving electricity.

Relation to Transit

- ◆ Lighting levels on transit platforms need to be significantly higher than the surrounding area. Amtrak, for instance, requires a lighting level of five footcandles on its platforms, lowering to two footcandles elsewhere in the facility.

Table 4.6. Recommended Illuminance Values for Walkways

Area Type	Illumination (f/c) minimum	Illumination (f/c) Pedestrian Supportive Areas
Pedestrian-supportive ¹	2.0	2.0
Mixed-use or commercial ²	1.0 - 2.0	2.0
Residential	0.4	1.0 - 1.5
Rural	0.2	N/A
Industrial	0.4	0.4
Parking Lots	1.8 ³	1.8
Bus Stops	1.0 - 1.5	1.5 - 2.0
Transit Platforms	5.0 at loading area; 2.0 elsewhere	5.0 at loading area; 2.0 elsewhere

1. Considered to have high nighttime pedestrian activities.

2. Level dependant upon expected nighttime pedestrian activity level.

3. Considered same level as Local/Local intersection (see following table)

Note: Uniformity Levels (UR) to not exceed 3:1

Source: *Adapted from American National Standard Practice for Roadway Lighting*; Publication RP-8, Illuminating Engineering Society of North America, 2000; and the *DRAFT City of San Diego Street Design Manual*.

Table 4.7. Recommended Pedestrian Illuminance for Intersections and Midblock Crossings

Functional Classification ¹	Average Maintained Illumination by Pedestrian Area (f/c) ²		
	High	Medium	Low
Major/Major	3.4	2.6	1.8
Major/Collector	2.9	2.2	1.5
Major/Local	2.6	2.0	1.3
Collector/Collector	2.4	1.8	1.2
Collector/Local	2.1	1.6	1.0
Local/Local	1.8	1.4	0.8

1. Major: >3500 ADT; Collector: 1500-3500 ADT; Local 100-1500 ADT

2. High: areas with high night pedestrian activities; Medium: moderate pedestrian nighttime activities - typically near community facilities; Low: typical in residential neighborhoods. (Note: values do not consider areas with increased crime and vandalism)

Source: *American National Standard Practice for Roadway Lighting*; Publication RP-8, Illuminating Engineering Society of North America, 2000.

Guidelines

1. Adequate and aesthetically pleasing lighting should be provided for safety, security, and a greater sense of comfort for pedestrians of all abilities, allowing pedestrians to quickly and accurately recognize cues to enable safe navigation.
2. All communities should provide as a minimum continuous pedestrian lighting in commercial area and within 1/4 mile of transit stations, schools, libraries, community centers and neighborhood retail stores.
3. In general, the minimum lighting levels for pedestrian ways and other locations are listed in Tables 4.6 and 4.7.
4. Driveways serving high volume activities, such as regional shopping centers, should be thought of as intersections and illuminated similarly to major intersections.
5. The appropriate height for pedestrian lighting is between 12 and 20 feet high. Light standards may also be combined on one post. Low, pedestrian-oriented lights can be affixed to a post and direct light onto sidewalks, while the same post may also accommodate auto-oriented lights directed at roadways.
6. In some cases, lighted bollards may be appropriate for providing light onto a pedestrian pathway or a pedestrian refuge island.
7. It is preferable for fixtures to be spaced close together with lower light levels rather than further apart with intense and varied light levels which can be uncomfortable for pedestrians.
8. Lighting should be contiguous in uniformity of light level.
9. Lamps should provide broad spectrum lighting.
10. In pedestrian supportive areas, low-pressure sodium lights should not be used, as they create an unnatural yellow cast which reduces safety and the quality of the environment.
11. Glare should be minimized and lights should be directed away from eye level, both standing and sitting.
12. The design of lighting systems that provide higher levels during more active times of the early morning and evenings should be considered. For example, employment areas could have pedestrian level lighting to supplemental standard street lighting which could be timed to shut off when pedestrian activity is lower. This reduces energy costs and potential “night sky” impacts.



Figure 4.64. Example of a tree well that provides ample space for roots although the use of pavers compacts the soil preventing the intake of oxygen.

4.5.4 Landscape

Vegetation, especially trees, provide for a pleasant pedestrian experience. Trees themselves may be the most visibly significant improvement made to a street if properly selected, planted, and maintained. They provide much-welcomed shade, create a pleasing rhythm to the street and create an effective buffer between the sidewalk and the street. Ground cover and shrubs may be appropriate along residential streets to adding character to the street, and along arterials increasing the visual buffering for pedestrians.

Issues to Consider

General

- ◆ Vegetation planted should reflect the identity of the San Diego region and the varied environmental settings within the region.
- ◆ Landscape practices should follow xeriscape principles, meaning that native, drought-tolerant species should be used as appropriate.
- ◆ Watering needs must be considered in selecting appropriate vegetation.

ADA Accessibility

- ◆ Tree grates or planting areas must be designed, installed and maintained so as not to pose an obstacle or tripping hazard.

New Development vs. Retrofit

- ◆ Mature landscape within an existing community, or within a proposed development site area is, or can become, important elements of an attractive pedestrian realm.

Relation to Current Standards and Practices

- ◆ Placement of trees needs to be in compliance with local street design regulations in terms of clear-zones from curb and sight distances at intersections.

Relation to Transit

- ◆ Landscaping can provide welcome shade at transit stops, but must be situated so as not to interfere with access to and egress from buses at bus stops.

Guidelines

1. Use street trees and other landscaping to complement street lighting and sidewalk amenities in creating a distinct character for specific streets or areas within a city.

2. Street trees should be planted between 15 and 25 feet on center, depending upon species, to allow a continuous canopy.
3. Trees need adequate surface area for their roots to grow, given that most tree species have the majority of their roots in the first 18 inches of soil. Therefore, a minimum of 36 square feet of soil should be provided for each tree when-ever possible. The standard four-foot by four-foot tree well so common in cities does not provide a healthy environment for trees over the long term. Similar to tree spacing, different species and soil conditions require different sizes of tree wells.
4. Where a landscape strip (the landscaped area between the street and the sidewalk - also known as a lawn, verge, or boulevard) is provided, it should be a minimum of 6 feet with a preferred width of eight feet wide.
5. Trees should be protected from car doors and overhangs, and vandalism with tree guards or, initially, with tree stakes.
6. Topping and severe pruning should be avoided. Proper maintenance of trees should allow trees to retain their natural form.
7. Hedges or trellises with vines should be used to screen street-facing parking lots from the sidewalk. See Section 4.7.3.



Figure 4.65. Pedestrian bulb-outs provide a location for landscaping the street.

4.5.5 Trails and Pathways

Trails and pathways can be defined as walkways that are off-road and often shared by a variety of users, including pedestrians, joggers, bicyclists, rollerbladers, horseback riders, etc. However, pathways and trails can also serve in place of a standard sidewalk along roadways in certain cases where the typical poured concrete sidewalk with a curb and gutter is prohibited due to steep terrain, inadequate drainage, significant trees or other right-of-way constraints. Furthermore, where existing roadways do not have adequate pedestrian facilities, a trail or pathway may provide for an interim improvement.



Figure 4.66. Otay Regional Trail

Issues to Consider

ADA Accessibility

- ◆ ADA standards for shared use paths are currently being developed. Jurisdictions will need to carefully consider how to provide improved access in areas with difficult topography or other natural features that can make ADA access difficult and expensive to provide.



Figure 4.67. A pedestrian bridge that effectively connects neighborhoods over a freeway

- ◆ Fully accessible pathways may not be feasible in situations where harm may come to existing natural and cultural resources; where there would be an alteration of the fundamental experience of the setting or intended purpose of the trail, or where terrain characteristics would be prohibitive.
- ◆ Signage is often necessary to describe the conditions of the path in order for the user to determine whether or not to use the path.

New Development vs. Retrofit

- ◆ Pathway and trail easements can be useful pedestrian connectors where a public road is not feasible or wanted, such as through private property or public property as in school fields, parks, etc.
- ◆ Pathways can provide for interim pedestrian connections along existing streets with no sidewalks.
- ◆ See also Section 4.5.6, “Midblock Accessways.”

Relation to Transit

- ◆ Trails and pathways may be effective at shortening routes between transit facilities and user's origin and destination.

Guidelines

1. Trails and pathways should be well-lit (except where environmental constraints preclude this kind of lighting) and have uninterrupted lines-of-sight to improve visibility and safety. (See Section 4.5.3 for further discussion of lighting).
2. In general, accessible trails and pathways should be built to meet ADA standards and should be easy to maintain over time - namely asphalt or concrete. Non-accessible trails and pathways may be surfaced with crushed stone or gravel.
3. Pathways and trails expected to have a high volume of users should have a paving width between 10 and 12 feet with a minimum two foot graded area adjacent to the pathway on both sides.
4. There should be a minimum vertical clearance of eight feet.
5. Grades should be no steeper than five percent with a graduated scale up to 11 percent for short distances for designated ADA accessible trails.
6. Cross slopes should not exceed two percent.



Figure 4.68 . Otay Ranch Paseo connecting neighborhoods to the Village Center

7. Where adjacent to a roadway, there should be a five foot minimum separation. If the trail is along the shoulder of the roadway, the minimum width should be ten feet.
8. Care should be taken in the design of path/trail roadway intersections.
9. Where cost or lower levels of pedestrian activity do not justify building a pedestrian bridge, paths and trails can provide for connections through canyons.

4.5.6 Midblock Accessways

Midblock accessways provide opportunities to maintain connectivity for pedestrians where circumstances do not allow for a multi-modal street to make a connection. (See Section 3.7.2 for a discussion of connectivity requirements). Higher levels of connectivity can be created in areas of existing development, through acquisition of easements for midblock accessways.

Issues to Consider

ADA Accessibility

- ◆ As with all walks, accessways must comply with ADA regulations.

New Development vs. Retrofit

- ◆ Accessways are appropriate for both new development and retrofitting an existing neighborhood.

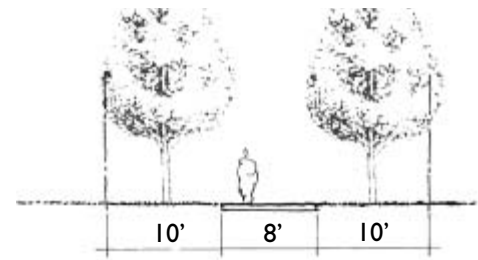
Relation to Transit

- ◆ Accessways are an effective method that improve accessibility between neighborhood and transit facilities.

Guidelines

1. Accessways should be as straight as possible to improve sightlines and security because they are removed from the existing street pattern.
2. Accessways should be used to maintain desired levels of connectivity for pedestrians.
3. Lighting should be provided in accessways at a minimum level of 1.8 foot candles. (See Section 4.5.3 for further information on lighting).
4. Midblock accessways should have a preferred width of 28' (eight foot pathway with ten foot planter areas on either side) with a minimum width being 13' (five foot pathway with four foot planter area on either side).

Preferred - 28'



Minimum - 13'

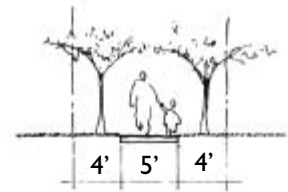


Figure 4.69. Midblock Accessways and cul-de-sac connectors dimensions



Figure 4.70. A landscaped pedestrian accessway linking a development's parking lot with street

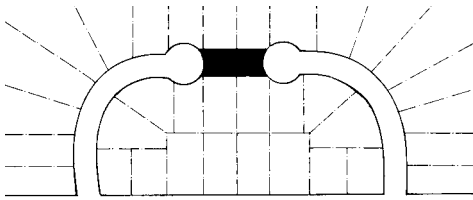


Figure 4.71. A connector linking cul-de-sacs

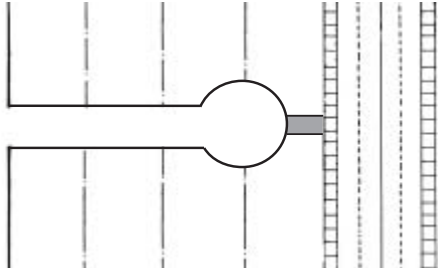


Figure 4.72. A connector linking cul-de-sac with adjacent street



Figure 4.73. Cul-de-sac connectors in Otay Ranch provide pedestrian and emergency vehicle access.

4.5.7 Cul-de-Sac Connectors

Providing pedestrian accessways ways between cul-de-sacs or between a cul-de-sac and adjacent roadway is an effective method for improving pedestrian accessibility and reducing walking distances within a neighborhood. For new development, cul-de-sac connectors can be required for design approval or in a retrofit condition, acquired by jurisdictions through outright purchase or public easements.

Issues to Consider

ADA Accessibility

- ◆ As with all walks, cul-de-sac connectors must comply with ADA regulations.

New Development vs. Retrofit

- ◆ Cul-de-sac connectors are appropriate for both new development and retrofitting an existing neighborhood.

Relation to Transit

- ◆ Cul-de-sac connectors are an effective method for improving accessibility between neighborhood and transit facilities.

Guidelines

1. Cul-de-sac connectors should be as straight as possible to improve sightlines and security because they are removed from the existing street pattern.
2. Lighting should be provided in accessways at a minimum level of 1.8 foot candles (see Section 4.5.3 for further information on lighting).
3. Accessways should be used to maintain desired levels of connectivity for pedestrians.
4. Gates may be necessary to prevent small children from wandering onto busy streets via the accessway.
5. Cul-de-sac connectors can be designed to allow emergency access by fire trucks and other emergency vehicles.

Mitigating the "Super Block"

Through the course of urban development "super blocks" were often created either outright or by vacating existing streets. The intent being to accommodate larger development. The consequence is that, if not properly planned, buildings within these blocks have little relationship to the street, and the blocks themselves can be a significant obstacle to pedestrian circulation in the neighborhood. Under these circumstances connectivity does not just have to be achieved along the street, but with the other buildings in and through the entire block.

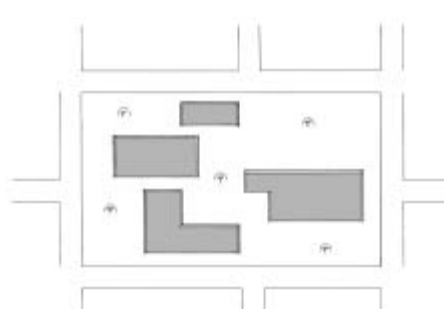


Figure 4.74. A disconnected block



Figure 4.75. Same block "stitched"

4.5.8. Stairways

The pronounced topography of the San Diego region provides for a scenic landscape of canyons and mesas, but the extreme grades also limit street connectivity and therefore opportunities for pedestrian connectivity along streets. For this reason, public stairways are needed. The region has several examples of these systems.

As with trails and pathways, a stair system differs from public sidewalks in that sidewalks are clearly defined as public walkways whereas for stairs it is sometimes less obvious - often appearing to be private.

Issues to Consider

General

- ◆ Stair placement, landscaping and lighting all contribute to making the pedestrian feel safe and secure, as does visibility to and from the stairway to ensure "eyes on the path."
- ◆ Obvious and proper signage will indicate the public nature of the stairway.

ADA Accessibility

- ◆ A stair system has limited use for pedestrians with mobility problems, especially for those in wheelchairs, scooters, and walkers.
- ◆ If feasible, an ADA accessible ramp system can be designed in lieu of stairs.

- ◆ If properly designed with handrails and resting areas, stairs have the potential to serve older pedestrians, and those with canes and crutches.
- ◆ Properly designed stairs with uniform risers and treads are also navigable for those with sight disabilities.
- ◆ Alternative accessible routes either along public sidewalks or via ramps should be provided where possible.

New Development vs. Retrofit

- ◆ When possible in a new development a ramping system should be considered in lieu of a stair system to ensure universal accessibility.
- ◆ Introducing a stair system into an existing neighborhood with a discontinuous street pattern due to extreme topography is an effective means of improving pedestrian connectivity.
- ◆ In existing development where a dedicated right-of-way does not exist, either the outright purchase or an easement through private property should be explored.

Relation to Transit

- ◆ In Oakland, California a series a stair system was developed in the early part of the century to connect residential neighborhoods in the hills with street car lines. The system continues to be very effective in reducing a pedestrian's walking time to current transit services. The applicability of ADA accessibility will need to be considered in developing new stairways. The City of Colma and BART have recently developed a stairway as a shortcut to a BART station with ADA accessible sidewalks provided along other streets which access the BART station.

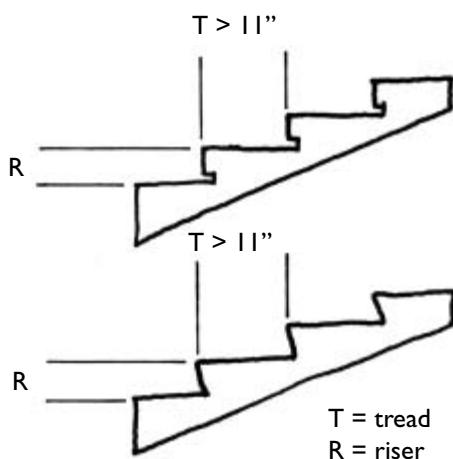


Figure 4.76 .Acceptable stair profiles with nosing options

Guidelines

1. Signage should be provided to indicate that the stair is a public right-of-way. The signage should inform the users about where the stair leads to, i.e. "Public Stairway to NW 55 Avenue."
2. The riser height and tread width of each stair should be uniform to each other with treads no less than 11 inches wide. The following formula can be used to determine appropriate tread to riser ratio: $2R + T = 26 \text{ to } 27 \text{ inches}$, where R = riser and T = tread.
3. The minimum width for a public stairway should be no less than five feet, and should comply with local building and fire codes if part of an exit way system.

4. Stairs should have solid risers and gradual nosing undersides that comply with ADA requirements.
5. The maximum heights between landings should be no more than 12 feet with lesser heights recommended to provide more frequent rest areas and better visibility between landings.
6. The minimum length of the landing should be a minimum of five feet or equal to the width of the stairway.
7. The design of landings should consider both their use as overlooks and resting areas with seating provided.
8. A continuous handrail should be provided which complies with ADA requirements.
9. Stairways should be designed to prevent the accumulation of water.
10. Narrow side ramps for bicycles and strollers should be considered.
11. Proper lighting should be installed for increased visibility and increased security, especially at the top and bottom of the stairway.
12. Surface materials should be durable, provide a slip-resistant walking surface, including a contrasting color per ADA, and be subject to regular inspection and maintenance.

4.5.9 Children, School Zones and the Elderly

Children cannot be thought of as “little adults.” They are more vulnerable, their movements are more unpredictable, and their sense of judgement of distance and speed are not yet well-developed. Special care therefore is essential in creating a safe environment for children, and this is nowhere more necessary than in school zones. Unfortunately, streets and neighborhoods surrounding schools often lack the most basic pedestrian facilities, requiring parents to drive their children, even short distances, to school. This in effect creates a “vicious cycle” where the school generates high levels of traffic, that only make the pedestrian environment less safe, requiring more parents to drive, and so on.

Section 3.3.5 discussed a general strategy in planning a school as a focal point in the community. This section deals with creating a safe and supportive means for connecting the neighborhood with the school and thereby reintroducing the experience of walking (or biking) to school.

The State of California, in coordination with related federal programs, encourages schools to address pedestrian safety by developing a “Safe Routes to School Program.” This type of program covers many of the elements mentioned in this section, and generally



Figure 4.77. Children have particular safety concerns.



Figure 4.78. Example of a school with poor pedestrian accessibility



Figures 4.79 and 4.80. Signage is necessary in school zones to caution drivers.

provides technical assistance and funding for physical improvements to school walking routes.

Senior citizens have a similar set of concerns in relation to pedestrian safety. While they have more experience in crossing streets, etc. many have slower walking speeds and impaired eye sight that needs to be considered in the design of pedestrian crossings.

Issues to Consider

General

- ◆ Elderly and school age pedestrians experience many of the same difficulties in crossing the street. Both typically walk at lower speeds and are less able to judge appropriate gaps in traffic due to developmental and visual restrictions.
- ◆ Young children have only a typical eye height of three feet and their peripheral vision is not yet developed.
- ◆ Children have problems judging speeds and distances, as well as adequate gaps in the flow of traffic.
- ◆ Children's movements are less predictable, and less easily seen by drivers.
- ◆ Children have shorter attention spans and are more likely to be impatient at crosswalks.
- ◆ Since children do not drive, they lack the understanding of what a driver's intentions might be at a crossing point or intersection.
- ◆ Adults also often overestimate the child's capabilities to deal with traffic.

ADA Accessibility

- ◆ As for small children, parked cars located near street crossings can prove to be a hazard to wheelchair users.
- ◆ Consideration should be given to the accessibility needs of disabled small children, which may not be consistent with the needs of disabled adults. For example, pedestrian push buttons may be too high for children in wheelchairs.

New Development vs. Retrofit

- ◆ School bus stops can be integrated into the design of new development or retrofitted to existing conditions.

Relation to Transit

- ◆ Bus stops require sufficient area away from the street for a group of children to congregate and wait.

Guidelines

1. Crossings along school walk routes should achieve maximum visibility by providing an unobstructed visual field between motorists and pedestrians. This may require locating or relocating street furniture, utility poles, mailboxes, etc. away from the crossing; limit landscaping at crossing point; and restrict parked vehicles to within 30 feet of the crossing.
2. All the following traffic control techniques should be considered in the vicinity of a school, along "safe route to school" routes, and senior facilities:
 - Reduced speed zones;
 - Traffic calming techniques (see Section 4.4.4);
 - Marked crosswalks;
 - Pedestrian bulb-outs and parking controls;
 - Crossing guards and student-patrolled crosswalks;
 - Signalized crossings with pedestrian activators;
 - Pedestrian refuge islands at intersections;
 - Technological devices at signalized intersections such as countdown pedestrian signals, audible signals, and passive pedestrian detection devices should be used near senior or school activity areas as appropriate; and
 - Special crosswalk striping and special "School Crossing" ("Senior Crossing" if near a senior facility) signs should be used at appropriate locations. School area crosswalks must also be painted yellow.
3. The following elements should be considered in the design or retrofit of a school site:
 - The buildings are accessible to pedestrians from all sides;
 - Secure bike parking is close to the building entrances;
 - Bus drop-off zones are separated from auto drop off zones to minimize conflicts;
 - Pedestrian walkways, paths, sidewalks and trails are clearly delineated from other modes of travel; and
 - Parking is minimized to encourage walking to school.
4. A recommended approach is to require that crossing guards should be present when 30 or more school-age pedestrians cross within an hour and traffic volumes exceed 300.
5. Sufficient waiting space away from the street should be provided for children at school bus stop locations.

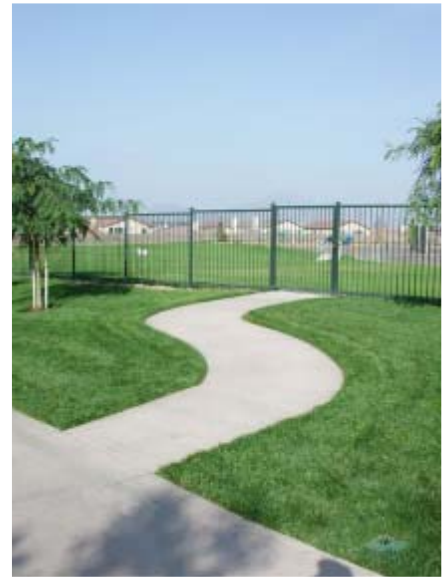


Figure 4.81. Otay Ranch walk to school

4.5.10 Safety in Work Zones

Construction projects often necessitate the temporary closure and/or detour of pedestrian paths. Pedestrian accessibility however should not be compromised to the point that safe and obvious connections to bus stops and crosswalks are eliminated.

Issues to Consider

ADA Accessibility

- ◆ Walkways must be clearly identified and wheelchair accessible, protected from moving vehicles, holes, and other debris.

Relation to Transit

- ◆ Construction zones often disrupt transit service and the access to, and location of, transit stops.

Guidelines

1. Pedestrian should be separated from conflicts with work site vehicles, equipment and operations.
2. Local jurisdictions responsible for traffic safety in work areas should train construction inspection staff to recognize improper and unsafe pedestrian facilities during construction.
3. Pedestrians should be provided with a safe, accessible, and convenient path that duplicates, as near as possible, the most desirable characteristics of sidewalks or footpaths.
4. When a parking lane exists next to a work site that closes a sidewalk, the parking lane should be used for a pedestrian detour route and temporary improvements should be made to protect pedestrians from the more directly adjacent traffic. The parking lane should also be the location for larger signage.
5. Advanced warning should be provided at intersections for pedestrians if it is required for them to cross to the other side of the street to avoid a midblock construction site.
6. Access to transit stops should be maintained, or if a temporary relocation of a stop is necessary, then appropriate signage should be provided to indicate this.
7. Florescent plastic fencing should be used as barrier in order to be more visible for the sight-impaired.

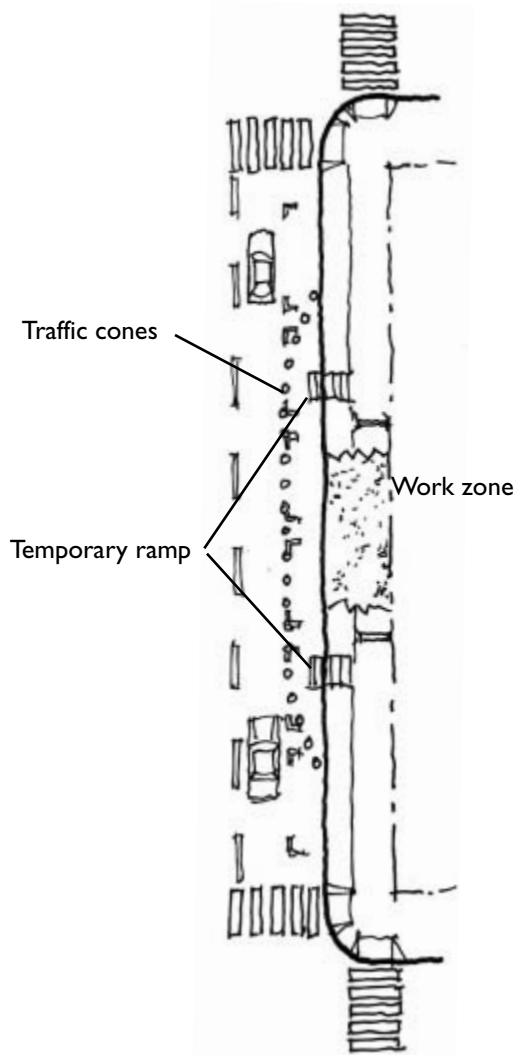


Figure 4.82. Parking lane used for pedestrian path (Adapted from Oregon Bicycle and Pedestrian Plan)

4.6 Building Design and Site Development

As stated earlier in this document, a good pedestrian environment needs more than just a well designed network of sidewalks. The context of streets and land uses is also very important to Pedestrian-oriented Design.

Disneyland understands pedestrians, as do shopping malls. Both understand that maintaining a pedestrian's visual interest can increase the distance they are willing to walk. The same techniques can be used to create a safe and comfortable pedestrian realm in our everyday communities. Development with frontage onto the streets provides surveillance, activity, and visual interest, and is achievable through the use of a continual and consistent building frontage with a high level of articulation (windows, doors, awnings, balconies, etc.).



Figure 4.83. Example of a well-articulated building

4.6.1 Addressing the Street - Creating Active Frontages

Issues to Consider

General

- ◆ The perceived level of security has bearing on the level of investment made in a community. Physical maintenance of buildings and quality of building materials signals to the pedestrian whether the area is being cared for and if it is safe to be there.
- ◆ Designing a safe and attractive pedestrian realm with development fronting the streets fosters increased sense of security. Urban planner, Jane Jacobs, coined the now much-used phrase "more eyes on the street" to describe how the users of a building themselves become an informal system of surveillance discouraging clandestine activity.
- ◆ The increased activity and visual interest associated with continuous building frontage can give the perception of shorter distances as opposed to crossing expanses of empty land, stretches of blank facades, long stretches of auto-dominated streetscape. This helps to make walking a more attractive mode of transportation.
- ◆ Buildings of appropriate height can effectively define the street and visually narrow it.
- ◆ Articulation provides visual interest and shade, and reduces the feeling of "exposure" for the pedestrian.

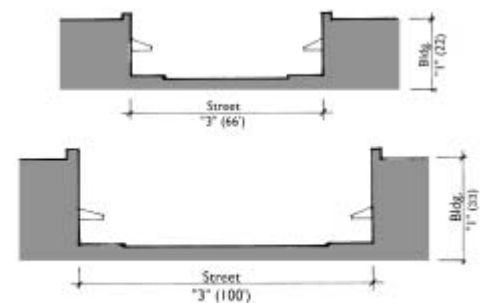


Figure 4.84. Building height to street ratio. A vertical height to street width ratio appropriate would be 1:3. For example, a 66' wide street could achieve a visual definition with 22' high buildings (a two story building or a one story building with a taller roof or parapet wall). The lower the ratio (i.e. 1:2) the more definition achieved.



Figure 4.85. Building recesses provide usable outdoor space despite the weather.



Figures 4.86. Building recesses and awnings increase the amount of protected outdoor space along a sidewalk.

- ◆ The level of consistent frontage and articulation depends on the district and use - i.e., a mixed-use district vs. a single-family neighborhood.
- ◆ An effective means of maintaining visual interest for a pedestrian is achieving a sense of "transparency" and connection between the pedestrian and the uses along the street.

For Residential Design

- ◆ On residential streets, porches, large windows, and welcoming entryways provide opportunities for friendly transition between public and private spaces.
- ◆ Within single family residential neighborhoods, the orientation and the design of homes can have a bearing on the pedestrian friendliness of a street. Homes with modest setbacks, generous porches, stoops, and a front walk have a direct relationship with the street and create a greater sense of enclosure and rhythm for the passerby.
- ◆ Many housing developments of recent decades have reoriented themselves, focusing mainly on the private space in the backyards. These developments are often referred to as "garage-scapes" in that the garage is the dominant architectural feature with the driveway being the only connection to the street.
- ◆ Many residential developments also back onto surrounding collector and arterial streets with fences or soundwalls leaving the streets to be dominated by vehicular traffic.
- ◆ The use of sound walls creates a tunnel effect along the arterial which encourages higher speed traffic and often results in other noise problems.

Guidelines

1. On pedestrian-oriented streets, buildings should front onto the majority of the street. Table 4.8 "rules of thumb" for establishing standards for the percentage of street frontage that should consist of articulated buildings.
2. Primary building entrances (e.g.; the front door to a home, the entry to a store, or the lobby entry to an office building) should front onto adjacent public streets or entry plazas.
3. The depth of front setbacks for pedestrian supportive areas should correspond with those in Table 4.9.
4. In a mixed-use commercial area, an appropriate building height is at least two stories (ground floor retail and upper floor residential or office). This height effectively defines the street.

5. Balconies, awnings, and colonnades (that maximize visual interest, shade, and weather protection) should be allowed to encroach up to six feet into the sidewalk area of the public right-of-way and be protected by easements.
6. To allow for their use, porches should have a minimum clear depth of 8 feet.
7. Windows facing the street give a sense of habitation and security and should encompass 50% of the facade length fronting onto the street in mixed-use areas.
8. Blank facades and mirrored or darkly tinted glass should be avoided as they give nothing back to the pedestrian and make for an uncomfortable walk.
9. Empty store windows should be kept clean and should be leased out to adjacent businesses for advertising, or non-profits could use the space for notices and announcements.

Residential Design

1. Frontage onto residential streets should include a readable series of zones transitioning from public to private, rather than an abrupt separation which occurs when a garage constitutes the majority of a home's street front.
2. Long stretches of walls, fences, and berms should be avoided, and a more creative solution to sound abatement explored which may entail breaking up the walls into sections and alternating with landscape features.
3. The issue of speed along residential streets, including collectors and arterials, should be aggressively addressed by physically narrowing the streets using bulb-outs, on-street parking, landscaped medians, bicycle lanes and/or widened sidewalks.
4. Stoops and open porches should be encouraged and allowed to encroach into the front yard setback. This provides for a friendlier streetscape where pedestrians can interact easily with their neighbors.
5. The wider the street, the taller buildings should be to define the street.



Figure 4.87. Typical suburban “garagescape”

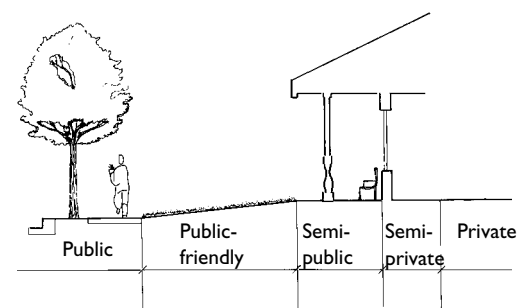


Figure 4.88. Pedestrian-friendly transition zones between sidewalk and home

Table 4.8. Minimum Street Frontage

Land Use Classification	Urban Form/Intensity	Min. Building Frontage
Mixed-Use, Civic, or Employment District	Urban Core	70 to 80%
Mixed-Use, Civic, or Employment District	Urban Strip	65 to 75%
Mixed-Use, Civic, or Employment District	Suburban	60 to 70%
Residential District	Urban Core	75 to 90%
Residential District	Urban Strip	65 to 75%
Residential District	Suburban	65 to 75%

Table 4.9. Maximum Building Setback

Land Use Classification	Urban Form/Intensity	Max. Building Setback
Mixed-Use, Civic, or Employment District	Urban Core	0 feet
Mixed-Use, Civic, or Employment District	Urban Strip	0 to 5 feet
Mixed-Use, Civic, or Employment District	Suburban	0 to 10 feet
Residential District	Urban Core	0 to 8 feet
Residential District	Urban Strip	0 to 12 feet
Residential District	Suburban	8 to 18 feet

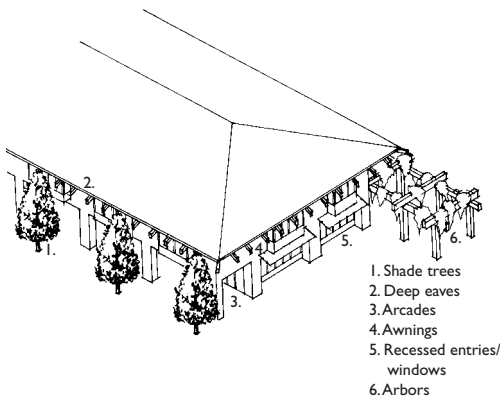


Figure 4.89. Examples of architectural climate controls

4.6.2 Designing for the Climate

While the desert-like climate in the eastern portion of the San Diego region can create some very uncomfortable times for pedestrians, the San Diego region has a climate that is ideal for pedestrians. Still, simple guidelines applied to development abutting the pedestrian realm can enhance the walking experience by providing a respite from excessive sun or sudden downpours.

Issues to Consider

General

- ◆ In a climate such as that in the inland areas of the San Diego region the provision of nearly continuous shade during the summer months is a necessity for comfortable walking.
- ◆ In most of the region, giving people a choice of walking in the shade is needed at some point during the year.

Guidelines

1. Development directly abutting the street should provide additional shading methods, such as awnings and arcades, which are also useful for pedestrians caught in sudden downpours.

2. Trees should be equally spaced along pedestrian routes to provide a minimum of 50% shade during the summer seasons. Refer to Section 4.5.4, Landscape, for specifications necessary for healthy planting.
3. Landscaping is a highly effective means of mitigating reflective heat along pedestrian paths caused by adjacent paved areas and should be utilized. Refer to Section 4.5.4, Landscape, for specifications necessary for healthy planting.

4.7 Parking Design

Successful pedestrian design guidelines must accept and recognize the importance of ample and convenient parking facilities for an economically viable community. Creating environments that provide people choice in mobility is important in both the near-term and the long-term, but it must be recognized that in the foreseeable future the automobile is likely to remain the primary method of transportation in the region.

Parking facilities however, can be integrated into the community or a specific site in such a way that they do not alienate the pedestrian, but actually encourage more pedestrian activity. This can be achieved by designing to not only accommodate the car, but also to allow for safe pedestrian and bicycle movement around and through the parking lot.

Issues to Consider

Relation to Transit

- ◆ Park and ride lots should also comply with these guidelines.

4.7.1 Parking Policy and Location

Issues to Consider

General

- ◆ The compact and mixed-use patterns of pedestrian supportive areas can reduce parking demand by making shared parking feasible. Typical parking standards specify the number of required spaces per square foot of use based on peak hour demand estimates. Mixed-use development will often include uses that have peak parking demands at different times. Thus, overall parking requirements can be reduced if the appropriate uses are mixed within one development or parking district. For example, office uses need parking during the day, while entertainment uses generally need parking in the evening.



Figure 4.90. Vast parking lots can effectively create barriers in a community if not well-designed.



Figure 4.91. A parking garage in Portland, OR with retail frontage addressing the street



Figure 4.92. Attractive landscape screens this parking garage

- ◆ Research conducted by Robert Cervero from the University of California at Berkeley in 1993 indicated that an American walks an average of 800 feet (1/8 of a mile) from car to work. Improvements made to the pedestrian realm (i.e. improved lighting, shade, visual interest along path, etc.) will reduce perceived distances and increase the actual distance an employee is willing to walk.
- ◆ The "perception" of auto dependency is fostered by an urban landscape dominated by parking lots.
- ◆ The interconnectivity between parking areas is important to maximize the utility of shared parking.
- ◆ Interconnectivity minimizes the need for curb cuts along the main arterial thereby reducing conflicts between driver and pedestrian.
- ◆ Business people need to reconsider their perception that large areas of parking need to be visible to potential patrons from the street with the entrance to their business beyond. People learn where parking is available and park there if they are attracted to a business and the district of which it is a part.

Relation to Transit

- ◆ Park and ride lots should also comply with these guidelines.

Guidelines

1. In order to promote an attractive and comfortable pedestrian realm the extent of street-facing parking lots should be minimized. Parking lots should be located towards the rear of sites with the street frontage defined by buildings.
2. Parking areas should be designed with pedestrian connectivity and circulation that allows people to "trip link," (meaning that you can drive to a mixed-use area and park your car once while taking care of several trips, rather than having to drive from parking lot to parking lot along a strip shopping area).
3. In mixed-use areas, parking requirements should take into account shared parking.
4. On-street parking should count towards a development's parking requirement, thereby reducing the number of off-street parking stalls required. (See Section 4.4.6 for further discussion of on-street parking).
5. Access to transit facilities should be taken into account in reducing parking requirements.

6. As properties redevelop, their parking should be designed to allow connections with parking lots on adjacent properties allowing drivers and pedestrians to cross property lines without returning to the street.
7. In newly developing areas, parking lots of adjacent properties should be interconnected.

4.7.2 Internal Pedestrian Circulation

In addition to the location of parking lots, the design of circulation within the parking lot is also important to create an environment that supports walking.

Issues to Consider

General

- ◆ Well-designed parking lots can be an asset by providing midblock pedestrian access points.
- ◆ Poorly designed parking lots however, can become serious barriers in the community and can be hazardous to the pedestrian if drivers are not reminded that they too have just finished being, or will soon become, pedestrians.

Relation to Transit

- ◆ Park and ride lots should also comply with these guidelines.

Guidelines

1. Clearly delineated walkways, separated from traffic lanes, should be provided from parking areas to the entrances of establishments as follows: Walkways running parallel to the parking rows should be provided for every four rows, and walkways running perpendicular to the parking rows should be no further than 20 parking stalls apart.
2. Walkways should provide a minimum clearance between car fenders of 5 feet.
3. Where the path crosses the auto lane, the path should be clearly delineated by a contrasting color, pavement pattern, and/or be raised slightly to form a speed table.
4. Parking lots with over 150 parking spaces should have walkways designed with adjacent planting areas for trees and other landscaping; smaller parking lots should include this treatment whenever possible. (See Section 4.7.3 for further information on landscaping in parking lots).
5. Walkways should be raised to standard sidewalk height.



Figure 4.93. Preferred pedestrian access through a parking lot



Figure 4.94. Evenly spaced trees within a parking lot create a comfortable microclimate for cars and pedestrians.



Figure 4.95. Detail of tree planting in an “orchard-style” parking lot

4.7.3 Landscaping

Expansive parking lots are not only visually unappealing but also a “heat sink” generating considerable reflective heat from cars and pavement that creates an uncomfortable environment for pedestrians within parking lots. Landscaping parking lots can effectively reduce the amount of reflective heat, keep parked cars cooler and attractively delineate pedestrian pathways within the lot.

Issues to Consider

General

- ◆ Landscape can be used within parking lots and along pedestrian pathways to visually and psychologically reduce the size of the lot and create a more pleasant pedestrian environment.

New Development vs. Retrofit

- ◆ Landscape can often be added to existing parking lots with minimal impact on the amount of parking while greatly improving the pedestrian environment.

Relation to Current Standards and Practices

- ◆ Most jurisdictions already have landscaping requirements for parking lots that are typically related to shading and buffering; these guidelines illustrate how those requirements can be modified to achieve a better pedestrian environment as well.

Relation to Transit

- ◆ Park-and-ride lots should also comply with these guidelines.

Guidelines

1. All lots greater than 24 stalls (approximately one-quarter acre) should provide a tree canopy that would eventually cover 50% of the lot at time of trees' maturity (approximately ten years from planting). To effectively achieve this coverage, trees should be planted “orchard-style” (i.e.; evenly spaced throughout the parking lot).
2. Trees should be planted along the interior pedestrian paths to provide needed shade.
3. In parking lots with over 150 parking spaces (roughly one acre in area) landscape areas with a minimum width of 5 feet should be located on both sides of at least 50% of the pedestrian walkways within the parking lot and these specially landscaped walkways should be well distributed

throughout the parking lot and provide direct access to the main entry points of the surrounding uses. In smaller parking lots this standard should be achieved whenever possible.

4. Each planted area should not be less than 25 square feet and drought-tolerant plants should be used to reduce watering needs.

4.7.4 Screening

Screening parking from adjacent street and sidewalks is necessary to maintaining a comfortable pedestrian environment.

Issues to Consider

General

- ◆ Parking lots abutting pedestrian-oriented streets should be effectively screened to reduce the sense of auto-dependency and encourage the sense of “pedestrian equivalence.”
- ◆ Walking past an open expanse of asphalt and cars can significantly raise temperature due to reflective heat, thereby reducing the comfort of pedestrians significantly.

New Development vs. Retrofit

- ◆ Most existing parking lots can be retrofitted to achieve these guidelines without a reduction in parking spaces.

Relation to Transit

- ◆ Park and ride lots should also comply with these guidelines.

Guidelines

1. The landscaped buffer between a sidewalk and a parking lot should be at least eight feet wide to provide space for both trees and a landscape screen of at least three feet six inches in height in order to screen the grill and headlights of vehicles.
2. At a minimum a two foot wide buffer landscaping area should be provided containing a three foot six inch minimum height hedge or other landscape screening device, such as a low wall with vines.



Figure 4.96.A planted trellis screens parking from the sidewalk



Figure 4.97. Public plazas can provide a community with a special identity; Oceanside, CA

4.8 Public Open Space and Parks

Public open spaces such as plazas, parks, and small landscaped areas provide pedestrians not only with a pleasant place to gather and rest, but also visual interest. The overall scale is, in general, secondary to the quality of the space. At a detailed design level, a pedestrian-friendly park and plaza design must be accessible, visible and attractive. The level of “active” uses will depend on the nature of the space. A park containing playgrounds and sports fields is obviously considered “active.” Active parks though should have facilities to accommodate the passerby who may not feel like partaking in the activities; a bench next to tennis courts or a grassy knoll adjacent to a playground would be welcome elements.

Issues to Consider

General

- ◆ Consider the formal or informal nature of the open space or park in the design of the open space itself, as well as the relationship to surrounding uses. Generally, design edges to be visually permeable from surrounding buildings and public streets.
- ◆ Accessibility does not preclude the park or plaza fronting directly onto a public or commercial building. In fact, this can create an active edge with cafe tables, displays, daycare facilities, etc.
- ◆ Public open spaces can serve as a “front lawn” to civic buildings appropriate for community gatherings and emphasizing the importance of the building.
- ◆ Visibility affords users a sense of safety, and can make the space more attractive to occupy. Studies have shown that users prefer a sense of “prospect/refuge,” meaning that they can situate themselves against something and have the maximum view outwards.
- ◆ The type and configuration of seating is also a major determinant in the attractiveness of a park or plaza.

Relation to Current Standards and Practices

- ◆ Some of the park activities recommended in the guidelines may not be a part of existing park standards which tend to focus mainly on active recreation and the amount of park space per the population of the surrounding area.
- ◆ The development of small parks and plazas, as suggested here, may not meet the minimum size criteria of existing city parks standards which often limit parks to being at least 5 acres.

Relation to Transit

- ◆ Small parks and plazas should be considered as an amenity for larger transfer stations.

Guidelines

1. In general, parks can be discussed in three categories; each based on scale and program (note that these definitions differ from definitions typically used in community plans and by most parks and recreation departments):

Greens and Plazas: smaller in scale (less than half a city block or less than one half acre); generally within mixed-use commercial districts, urban residential neighborhoods, major transit facilities and/or associated with civic uses; facilities include seating, performance areas, hardscaped areas, multipurpose lawns and “tot lots” (small playgrounds for young children).

Neighborhood Parks: generally one half to one city block in size or about one half to three acres; parks should be distributed throughout the community to allow most residents to be within a three to four block walk; they can be shared with schools; facilities include playgrounds, multipurpose lawns, small court game areas and seating.

Community Parks: generally greater than one city block or about 3 to 10 acres, and service a larger area of a community; these parks should be connected to the community by means of a networked open space (for pedestrian, joggers and cyclists); facilities accommodate more organized sports such as basketball, soccer, swimming and softball; playgrounds and formal picnic areas are also generally provided. (Regional parks are larger than 10 acres and are not discussed in these standards and guidelines).

2. Public open spaces should have as great a “public” perimeter (at least 70%) as possible making it accessible and visible from the surrounding community. A “public” perimeter is an active area accessible to the public – public streets or walkways with buildings and active uses fronting onto them.
3. A fence should not prohibit access into the park during daylight hours, although fences may be installed around children's play areas or active sports facilities for security and control. Fences should be visually permeable and buffered with landscaping.
4. Visibility into and through parks should be considered in the location, size, and design of parks.
5. Park paths should support direct connections into the park from surrounding neighborhoods and commercial areas.



Figures 4.98 and 4.99. Terraced Orchard Park in Otay Ranch



Figure 4.100. An innovative fountain as public art and active play area

- 6 Civic buildings should be complemented with public open spaces to serve as important gathering places.
7. Parks should respond to climatic conditions in the region by adequately providing shaded areas for comfortable summer use and sun-exposed areas for comfortable winter use. In some areas protection from seasonably high winds will also be needed.
8. Activity should be encouraged by allowing private cafes to place tables along the perimeter, installing permanent chessboards, integrating a small stage or amphitheater, and allowing vendor carts in the park space. In residential neighborhoods, homes should front onto the park rather than bordering the park with privacy fences.
- 9 Public washrooms should be provided if adequate maintenance and safety can be assured.
10. The amount of seating provided should consider the activity generated by uses in the park and the intensity of surrounding activities; too much empty seating makes a park seem unsafe.
- 11 Seating should be configured to allow the user maximum choice depending on the desired level of privacy and visibility, sun/shade, proximity to activity (such as sports fields), and to allow two people or a group to face each other for conversational purposes.



Figure 4.101. Example of signage design guidelines that create a particular identity

4.9 Signage

Commercial signage is an important part of the street environment and is often scaled to adjacent vehicular traffic which can reinforce the dominance of vehicles in the street environment. Depending upon the character of a street, a balance needs to be achieved between signage for vehicles and signage that is scaled to and informs the pedestrian.

Much like the character of its buildings, signage should reflect the character of a place. Plastic, internally illuminated signs containing large and simple lettering are typically associated with mini-malls and drive-throughs, which convey a preference for auto-orientation, particularly if they are allowed to dominate the landscape. On the other hand, finely crafted signage with ample detailing and smaller character type conveys that shops wish to attract the pedestrian.

Issues to Consider

ADA Accessibility

- ◆ Signage on walkways and sidewalks needs to be kept out of the five foot clear zone necessary for wheelchair access, and above the eight foot clear height for the visually impaired.

Guidelines

1. Sidewalk signage should not impede wheelchair movement or reduce the through zone as discussed in Section 4.5.1, but can be incorporated into the furnishings zone.
2. In pedestrian-supportive areas, signage dimensions should be kept at a pedestrian scale and demonstrate a high level of detailing and craftsmanship. Pole-mounted signs should not be allowed within or adjacent to walkways or sidewalks.
3. In other areas, signage should be provided for both pedestrians and those driving vehicles. Pole-mounted signs should not exceed a height of 12 feet and should not be located within walkways or sidewalks.
4. Externally illuminated signs should be used, as such lights tend to illuminate signs and not pedestrians, minimizing glare. In pedestrian supportive areas internally illuminated signs, with the exception of neon, should be avoided as they are typically designed to attract drivers and are too intense for pedestrians.
5. Flexibility should be granted to artisans and craftspeople who may wish to create unique signage that may contribute to the sense of place.



Figure 4.102. Although at an auto scale, San Diego's neighborhood gateway signs provide visual interest and the pedestals provide a refuge area as well.



Figure 4.103. A signal box converted into a piece of public art

4.10 Public Art

Many of the improvement projects that are affected by these guidelines will be constructed using public money, and will therefore include a portion of their budget to be set-aside for public art. Pedestrian improvements create a unique opportunity where people can see and be positively impacted by public art as part of their everyday activities.

Issues to Consider

- ◆ On a large scale, public art has the ability to unify a district with a theme, and at a pedestrian scale can provide visual interest for the passerby.



Figure 4.104. Public art integrated into a pedestrian bridge



Figure 4.105. Example of playful public art with a utilitarian purpose

- ◆ Public art is not a replacement for good urban design. A mural can mitigate the effects of a blank facade, however, attempts should be taken to minimize the presence of a blank facade or other detrimental design features.
- ◆ Public art is an effective means of creating a neighborhood identity, and ideally should reflect the character and history of the community.
- ◆ All installations do not need an educational mission - art can be playful.

Guidelines

1. Public art should be located so as to be a pedestrian amenity. A piece can act as a focal point in a park or plaza or present a “surprise” along a pedestrian path rewarding only the passerby.
2. Consideration should be given to incorporating art into otherwise mundane street elements such as light poles, benches, trash cans, etc.

4.11 Vacant Lots

As an area develops incrementally, some land must remain unused until the local economy can support its development. Unfortunately such vacant lots are often a source of blight for a neighborhood and are detrimental to the quality of the pedestrian environment.

Issues to Consider

- ◆ Simple housekeeping initiatives (public or private) show that there is thought and care put into the neighborhood.

Guidelines

1. Vacant lots should be kept clear of debris and maintain an attractive and functional fence with landscape screening or use the lots as community gardens.
2. Vacant buildings should be maintained to the level of occupied buildings.

Appendices

Glossary

Accessible Pedestrian Signal - A device that communicates information about pedestrian timing in a non-visual format including audible tones, verbal messages and/or vibrotactile information.

Accessway – a formalized path, walkway, or other physical connection that allows pedestrians to efficiently reach destinations.

Americans with Disabilities Act of 1990 (ADA) - Federal law prohibiting discrimination against people with disabilities. Requires public entities and public accommodations to provide accessible accommodations for people with disabilities.

Americans with Disabilities Act Accessibility Guidelines (ADAAG) - provides scoping and technical specifications for new construction and alterations undertaken by entities covered by the ADA.

Arcade – a covered walkway attached to a building and supported on the sides not attached to the building by columns.

Arterial - major through route.

Articulation – the visible expression of architectural or landscape elements through form, structure, or materials that "break up" the scale of buildings and spaces to achieve a "human scale."

Audible Warning - See *Accessible Pedestrian Signal*.

Berm – an artificial bank of earth. Berms can physically and visually separate areas and provide visual and physical level changes by raising landscape elements above grade.

Build-to Line – a given distance from a property line where the façade of the building within that property must be located.

Collector Street - A roadway linking traffic on local roads to the arterial road network.

Commercial Parking Facility – a parking structure or a surface parking lot operated for profit that has parking spaces that are not accessory to a primary use. This term does not include a park- and-ride lot.

Compact Development – the planning concept of using site design and urban design techniques to decrease the amount of land needed to develop a given amount of land use. In the case of TOD, this is done with the goal of improving transit access.

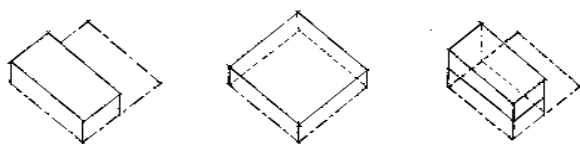
Crosswalk - At an intersection, the extension of a sidewalk or shoulder across an intersection, whether it is marked or not.

Curb Ramp - A combined ramp and landing to accomplish a change in level at a curb. This element provides street and sidewalk access to pedestrians using wheelchairs, scooters, strollers, walkers, etc.

Density – a unit of measurement that divides persons, floor area, or dwelling units per the gross or net measurement of a discreet area e.g., acres, square feet, square miles. Density requirements in this document are expressed as gross densities with the land area including the area of the parcel, specific to the use including its yard and any parking provided, plus the area of one-half of the street right-of-way upon which the parcel fronts.

Drive-Through Facility – facilities allowing transactions for goods or services without leaving a motor vehicle.

Floor Area Ratio (FAR) – the amount of enclosed gross floor area in relation to the amount of site area. For example, a floor area ratio of 0.5 is equal to one square foot of floor area for every two square feet of site area.



Footcandle - A unit of measure of the intensity of light falling on a surface, equal to one lumen per square foot and originally defined with reference to a standardized candle burning at one foot from a given surface.

Frontage – the linear edge of a property adjacent to the property line abutting a street, public right-of-way.

Grade-Separated Crossing - A facility such as overpass, underpass, skywalk or tunnel that allows pedestrians and motor vehicles to cross each other at different levels.

Gradient – the change in density, height, and/or land use occurring in stages, degrees, or even and continuous change.

Greenway – a singular or a series of vegetative, linear corridors, natural or man-made, which may contain active or passive recreational uses or which may prohibit human activity altogether in order to preserve sensitive areas. These are usually associated with riparian systems, but may also include transportation corridors.

Human Scale – the size and proportion of a physical element that closely relates to the human body e.g., a 16 foot lamp post vs. a 30 foot lamp post, and a façade with vertically oriented framed windows vs. a façade with a continuous and unarticulated window wall.

In-pavement Crosswalk Lights - A device consisting of multiple lights embedded in a roadway that become illuminated and flash when a pedestrian is in the crosswalk. The lights may be pedestrian-actuated by push-button, or may be configured to flash automatically using infrared or motion detectors. The flashing lights are visible during both daytime and nighttime conditions. The lights continue to flash for a determined length of time which is adequate for pedestrians to cross the entire street width.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) - Federal legislation authorizing highway, highway safety, transit, and other surface transportation programs from 1991 through 1997. It provided new funding opportunities for sidewalks, shared use paths, and recreational trails. ISTEA is now superseded by the *Transportation Equity Act for the 21st Century*.

Landing - A level area of sidewalk at the top, bottom or mid-point of a ramp.

Light Rail Transit (LRT) – a fixed guideway transit system that can operate on a variety of rights-of-way ranging from on-street to grade separated.

Live-Work – a residential unit that is also used for commercial purposes for a time, with minimum of 50% of the total building area given to the commercial use within the same structure as the residential component.

Local Road - A road that serves individual residences or businesses, and/or distributes traffic within a given urban or rural area.

Local Access Road - Also known as Side Access lanes - traffic lanes within a multiway boulevard street configuration that are separated from thru-lanes by a median; lanes are slower providing local access and may provide on-street parking.

Lot Coverage – Areas of a lot or parcel covered by buildings (as defined by foundation perimeters) and other structures with surfaces greater than 36 inches above the finished and natural grade.

Major Pedestrian Route – the primary route or space used by "Pedestrians" as defined in this section.

Median - An island in the center (or side in case of a multiway boulevard configuration) of a road that can provide pedestrians with a place of refuge and reduce the crossing distance of the road. See also Pedestrian Refuge Island.

Minimum Clearance Width - The narrowest point on a sidewalk or trail. Created when obstacles such as landscaping, utility poles, street furnishings that protrude into the sidewalk are removed or relocated.

Mixed-Use – Development contained within a single-parcel (horizontally or vertically) or adjacent parcels that contains different uses that are complementary to each other and provide activity throughout the day.

Open Space – a private or public open land area that is currently undeveloped; it may be maintained as open space into the future or it could be developed.

Parking Structure – a parking garage located above ground or underground consisting of one or more levels, not surface parking.

Park-and-Ride Lot – A parking structure or surface parking lot intended primarily for use by persons riding transit or carpooling, and that is owned or operated either by a transit agency or by another entity with the concurrence of the transit agency.

Parking, Off-Street – formal or informal parking located within a parcel and outside a private or public right-of-way.

Parking, On-Street – formal or informal parking located within a private or public right-of-way and outside of a parcel.

Pedestrian –a pedestrian means people who walk, sit, stand, or use a wheelchair in public spaces, be they children, teens, adults, elderly, people with disabilities, workers, residents, shoppers or people watchers, etc.

Pedestrian Activity – the congregation of persons in an area whose primary means of transportation is by foot.

Pedestrian Actuated Traffic Control - Pushbutton or other control operated by pedestrians designed to interrupt the prevailing signal cycle to permit pedestrians to cross a signalized intersection or midblock crossing.

Pedestrian Bulb-out - A section of sidewalk extending into the roadway at an intersection or mid-block crossing, generally the width of the parking lane, that reduces the crossing width for pedestrians and help reduce traffic speeds.

Pedestrian-oriented Design – The design of communities, neighborhoods, streetscapes, sites, and buildings that emphasizes pedestrian access, comfort, and visual interest. Transit-Oriented Design is a particular type of Pedestrian-oriented Design that includes design and intensity of land use to support transit in addition to pedestrians.

Pedestrian Realm - Space that is designed for, and occupied by, pedestrians.

Pedestrian Refuge Island - An island in a central median within a right-of-way where a pedestrian who is unable to make the crossing at one time can safely pause.

Pedestrian Way – a linear space or an area where the primary users are pedestrians and that may also accommodate bicyclists.

Pergola – an arbor or passageway with a roof or trelliswork on which climbing plants can be trained to grow.

Portico – a porch or walkway with a roof supported by columns, often leading to the entrance of a building.

Porch – an open or enclosed gallery or room attached to the outside of a building, typically serving as a semi-public space prior to a building entry.

Primary Front Façade – the façade of a building that is meant to take importance over the remaining façades of a building, typically fronting onto a public or private street or pedestrian accessway.

Rural - Areas outside the boundaries of urban areas.

Setback – the distance between the building façade and the property line of the parcel in which the building is located.

Shared Parking – parking that is utilized by two or more uses taking into account the variable peak demand times of each use; the uses can be located on more than one parcel.

Sidewalk - A paved pathway paralleling a roadway intended only for pedestrians.

Sight Distance - The length of a roadway visible to a driver or pedestrian; the distance a person can see along an unobstructed line of sight.

Street-Facing – the façade of a building that is adjacent to a public or private right-of-way.

Suburban - Area outlying a city that is developed as a community.

Swale - A natural or human-made open depression or wide shallow ditch that intermittently contains or conveys stormwater runoff.

Tactile Warning - Change in surface condition providing a tactile cue to alert visually impaired pedestrians of a potentially hazardous situation.

Transit-Oriented Development (TOD) – a development pattern characterized by a mix of uses surrounding a transit platform where streets have a high level of connectivity, blocks are small, and streetscape, buildings, and uses cater to the pedestrian.

Transportation Equity Act for the 21st Century (TEA-21) - Federal legislation authorizing highway, highway safety, transit, and other surface transportation programs from 1998 through 2003. It provided funding opportunities for pedestrian, bicycling, and public transit facilities, and emphasizes intermodalism, multimodalism, and community participation in transportation planning initiated by ISTEA.

Trellis – a light framework of horizontal and vertical members that can be freestanding or attached to a building often supporting climbing plants.

Truncated Domes - Small domes with flattened tops used as tactile warnings at transit platforms and curb edges.

Uniform Federal Accessibility Standards - Accessibility standards that all Federal agencies are required to meet.

Urban - Places within boundaries set by State and local officials, having a population of 5,000 or more. Urban areas are characterized by dense population and a density of built structures.

U.S. Access Board (United States Architectural and Transportation Barriers Compliance Board) - Federal agency responsible for developing Federal accessibility guidelines under the ADA and other laws.

Visual Permeability – the ability of vertical surfaces to allow viewers to see through to the other side e.g., windows and open fencing. (See also "Transparent.")

Walk Interval - A traffic signal phase in which the WALK signal indication is displayed.

Walking Radius – the distance beyond a central point from which a person is willing to walk. This distance will vary depending on existing barriers, the walking environment, and the availability of destinations.

Woonerf - also known as a "Slow Street" - a local residential street designed for common use by both pedestrians and vehicles - each have equal status. Generally there are no curbs, and plantings and street furniture are placed so as to discourage and inhibit through traffic movements.

2. Sources

This source list is intended to provide an overview of the most recent and most relevant source (primarily guideline precedents) pertaining to the subject of pedestrian-oriented design guidelines. It is not intended to provide an exhaustive review of the literature; rather a relatively focused effort to identify research that may have relevance to the SANDAG Model Pedestrian Design Guidelines.

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